THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

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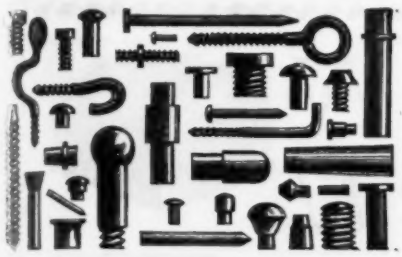

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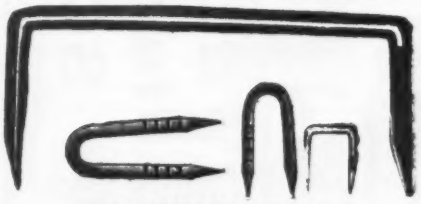

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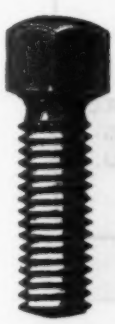

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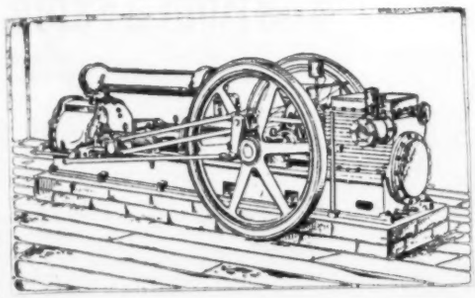

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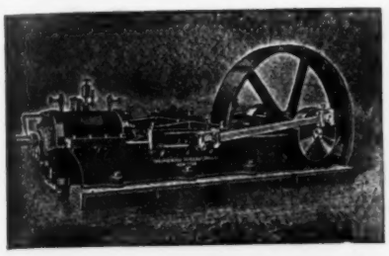

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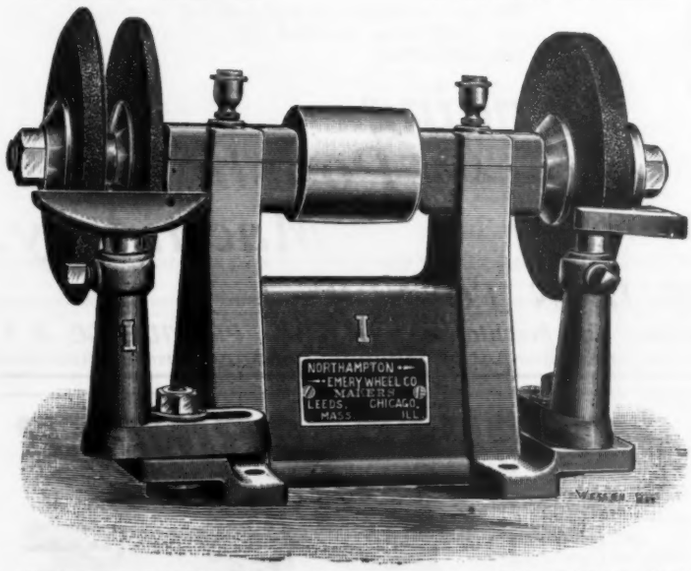

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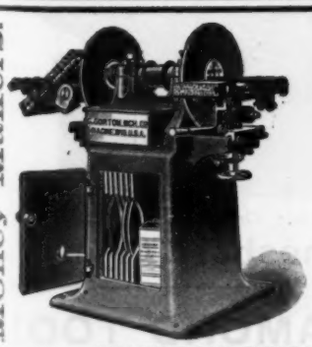

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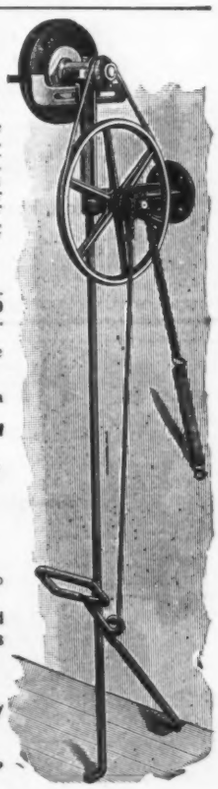

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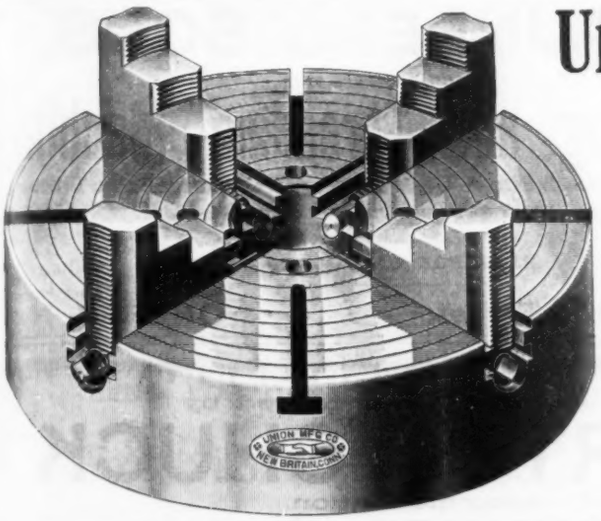

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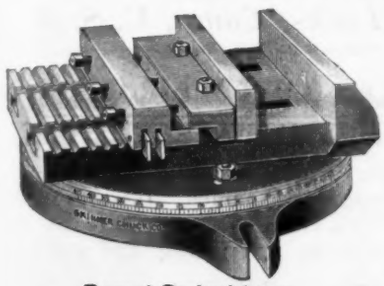

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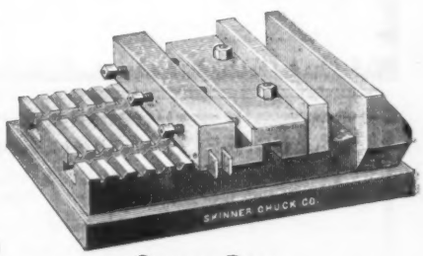

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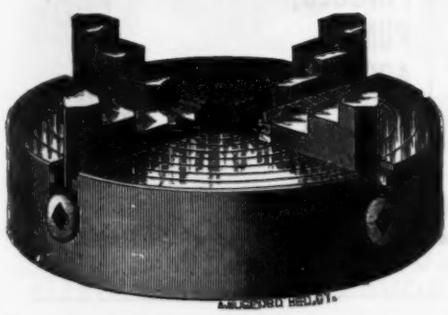

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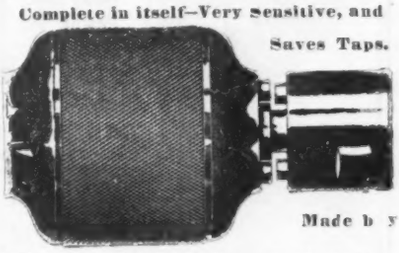

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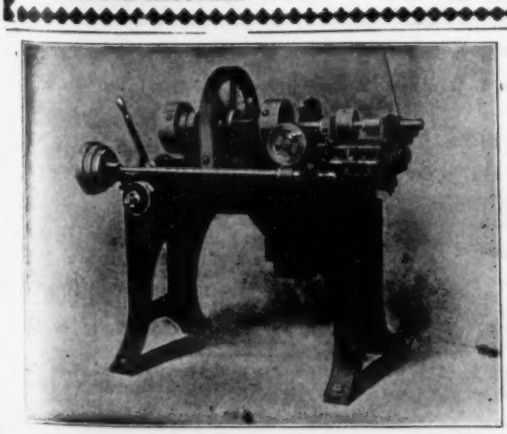

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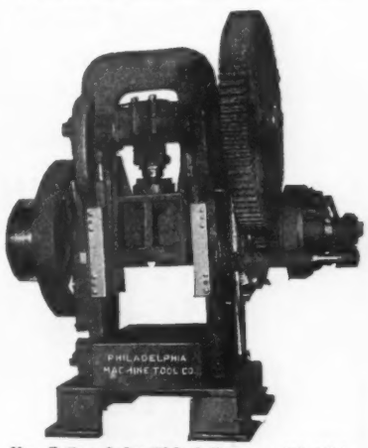

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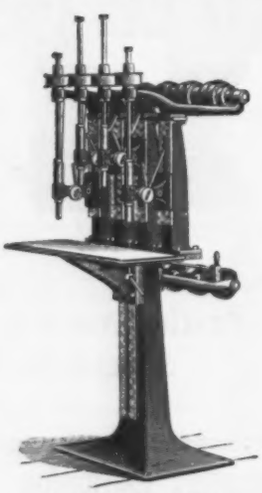

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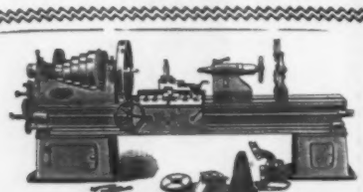

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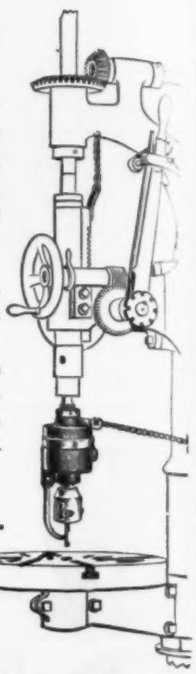

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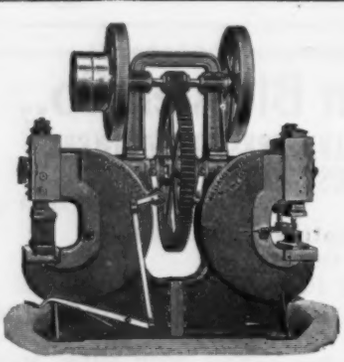

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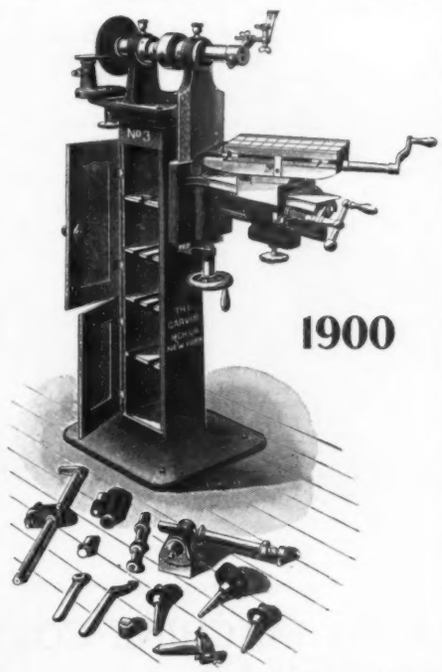

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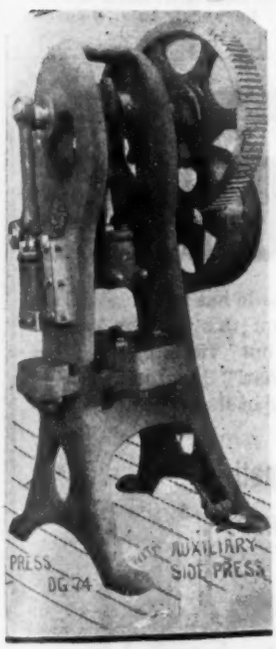

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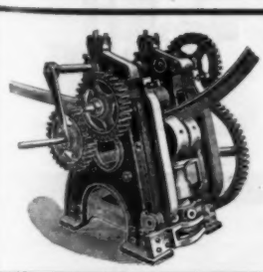

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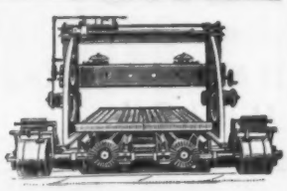

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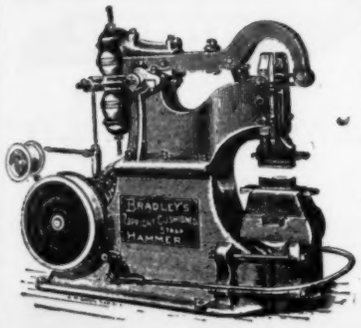

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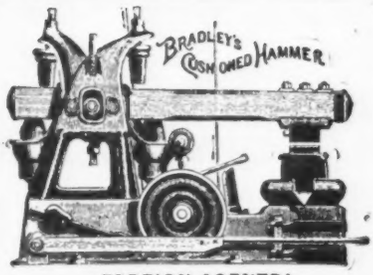

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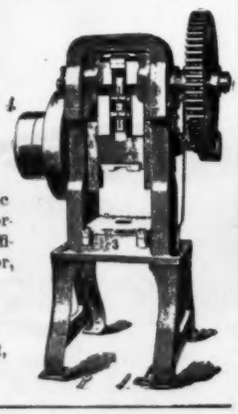

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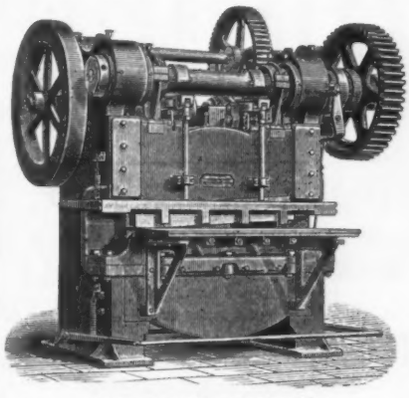

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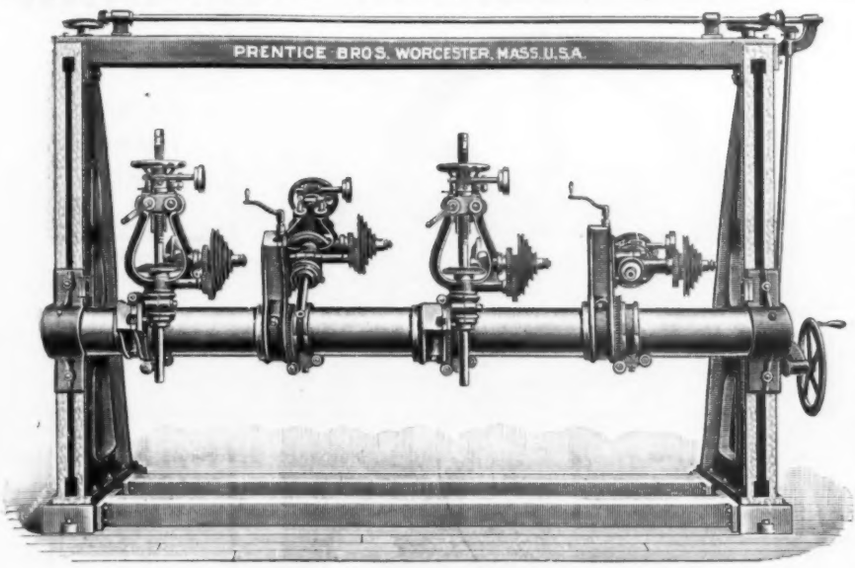

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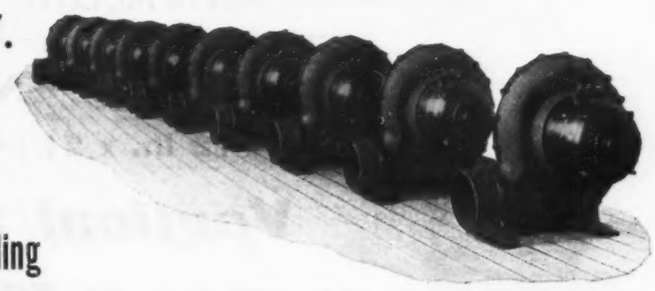

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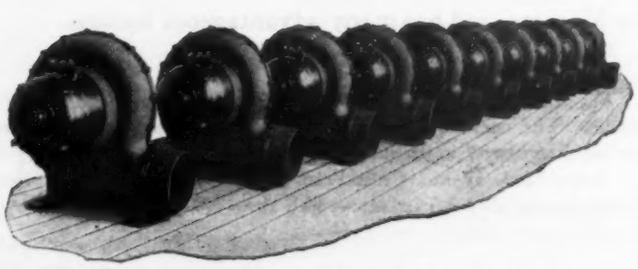

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60 and 80 lb. Bradley Hammers.
No. 6 Root Blower.
No. 3 Bell Steam Hammer.
110 in. Box Radial Drill.
80 in. " " " very heavy.
15 in. Pratt & Whitney Crank Shaper.
13 in. x 5 ft. Pratt & Whitney Tool Lathe.
25 in. Horizontal Boring Machine.
27 in. x 8 ft. Fitchburg Planer.
36 in. x 14 ft. " "
DAWSON & GOODWIN, 41 So. Canal St., Chicago.

2d HAND FEED WATER HEATERS.

Largest stock in America. Will be sold at bargains. These heaters are mostly taken in exchange for our improved Berryman (Kelley's Patent), "A Little Giant," vastly superior to all other feed water heaters, both as to results and durability.

BENJ. F. KELLEY & SON, 91 Liberty St., N. Y.

FOR SALE.

Westinghouse Comp. Engine, 50 H. P., $360. 35 Arc Light, T.H. Dynamo, $250. No. 4 Delamater Steam Pump, 4 in. suc., $100. 20 H. P. Locomotive Boiler, $100.

SCHULTZ & CO.,
Rothschild Bldg., 14 South Broad St., Philadelphia.

FOR SALE.

850 HORSE POWER HEINE WATER TUBE BOILERS

TWO 350 H.-P. UNITS.
ONE 150 H.-P. UNITS.

Complete with McClave Shaking Grates, Breechings, full set of fixtures and trimmings.

May be inspected at West Side Power House, Rockford Edison Company, Rockford, Illinois.

Two 72 x 16 Tubular Boilers, 824 in. flues, breeching and 48 in. x 80 ft. stack. Built 1897. *Hartford Insurance at 125 pounds pressure.*

Two 66 x 16 Tubular Boilers, 58 4 in. flues, "A" breeching. *Hartford Insurance at 100 pounds pressure.*

Four 60 x 16 Tubular Boilers, 44 4 in. tubes; 100 pounds pressure.

Eight 44 x 16 Tubular Boilers, 32 4 in. flues, all fixtures and trimmings

One 1200 H.-P. Berryman Feed Water Heater. Used two months. Built 1898.

WETHERILL CORLISS.

One right hand Wetherill Corliss Engine, cylinder 28 x 60; flywheel 20 feet diameter, weight 30 tons; shaft 15 in. x 12 ft. 6 in.; rope drive pulley 18 ft. diameter and grooved for 15 2-inch ropes; driven wheel 78 in. diameter grooved for 13 2-inch ropes; two iron idlers with boxes complete. With or without Independent Condenser 10x14x16.

W. W. WHITEHEAD,
DAVENPORT, IOWA.

ENGINES AND BOILERS.

12 x 36 Lane & Bodley Corliss
14½ x 15 Phoenix Automatic
7 x 7 Payne " "
14 x 20 Atlas " "
11 x 30 Fitchburg " "
13 x 26 Buckeye " "
} Engines.

and others second hand. Also
2 66 x 18 Hor. Tubular Boilers.
2 66 x 16 " " "
Send for complete list of second-hand machinery.
W. D. NORTON, 6th and Carr Sts., Cincinnati, O.

FOR SALE.

AT A BARGAIN.

1 Second hand Corliss Engine, 14 in. x 42 in.
1 Blake Stone Crusher, 15 x 9 with screen.
1 Dean Duplex Steam Pump, 5 x 3½ x 5.
3 Edson Diaphragm Pumps.

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One 18 in. x 42 in. Watts Campbell and 22 in. x 42 in. Wright Corliss Engines. High Speed Automatic, Simple, Compound, Condensing and Slide Valve Engines; also Blowing Engines, Boilers, Heaters, Pumps, Vacuum Pans, Ice Machines, Electric Motors, Generators, Railway Supplies, Metal Working and General Machinery.

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ENGINES, STATIONARY and MARINE

2 Eaton and Prince Passenger and Freight Elevators.
2 Upright Marine Engines; also one 14 x 18, and one 12 x 20 Horizontal Engine.
Machinery bought, sold and erected.
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New and Second Hand Machinery in Stock for Immediate Delivery.

4 in. bar 8 ft. table Newark horizontal boring and drilling machine, power lift, new.
56x14 Nicholson & Waterman, ditto, new.
12 ft. Knowlton vertical boring and turning mill, good as new.
60 in. Wm. Sellers & Co.'s, ditto, 2 heads; good order.
60 in. Bickford vertical boring and turning mill, 2 heads, new.
63x60x24 Hewes & Phillips planer, fine order.
26x26x5 Pond planer, good order.
42x36x12 ft. Cincinnati planer, 2 heads, new.
33x33x10 Cincinnati, ditto, new.
30x30x14 ft. Cincinnati, ditto, new.
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68x28 Fifield triple grd. lathe, new.
44x26 Fifield, ditto, new.
42x16&18 ft. Lodge & Shipley, dittos, new.
38x23 ft. Fish triple grd. ditto, new.
36x14 Fish, ditto, new.
32x18&22 ft. Fay & Scott lathes, new.
31x12, 14 & 16 ft. Davis lathes, new.
30x14&16 ft. Lodge & Shipley lathes, new.
25x10, 12, 14 & 16 ft. Davis lathes, new.
24x12&14 Lodge & Shipley lathes, new.
20x8, 10 & 12 ft. Lodge & Shipley lathes, new.
20x10&12 ft. Putnam lathes.
20x8, 10, 12 & 14 ft. Cincinnati lathes, new.
96x14 ft. triple grd. lathe, C. R., good order.
40x17 ft. 4 in. Johnson lathe, fine order.
36x16 ft. 6 in. Pond lathe, good order.
No. 3 6-ft. arm Bickford radial drill, new.
2 36 in. Cincinnati upright drills, B. G. & P. F., new.
Pratt & Whitney spindle, 4-spindle double-head milling machine, practically new.
2 No. 6 Brainard plain millers with centers, good as new.
Also large assorted stock of shapers, milling machines, &c. Send for complete list.

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Chucking Machines.

Plain and Friction Heads.

5 14 in. Plain, 1 5-16 hollow spindle.
1 14 in. friction geared, 1½ hollow spindle.
2 16 in. " " 1 5-16 hollow spindle.
3 16 in. " " 1¾ " "
Pratt & Whitney make. Condition A1.

A. B. Pitkin Machinery Co.,
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A BARGAIN

ONE

8 H. P. Motor, used but two weeks on a merry-go-round, good as new, 500 volts.

ONE

6 H. P. Gas Engine, strictly first-class order.

WE WILL SELL

either of the above at a great bargain and can ship immediately.

THE W. P. DAVIS MACHINE CO.,
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BARGAINS.

One 16 in. x 36 in. Wetherill Corliss Engine, practically new.
Large stock of Corliss, Automatic and Plain Slide Valve Engines.
Horizontal and Vertical Boilers, all sizes and descriptions.
Let us know your needs.

LOVEGROVE & CO.,
Philadelphia, Pa.

ENGINES.

Immediate Delivery.

1 18½ x 18 Ideal.
2 18½ x 18 McIntosh & Seymour.
1 14½ x 15 " "
2 15 x 14 Ideal.
1 12 x 20 x 14 Ideal Tandem Compound.
2 13 x 12 Ideal.
1 8 x 10 Ball.
1 6 x 8 Vertical.
1 1000 H. P. Austin Open Hot Water Heater.
2 7½ x 5 x 6 Worthington Duplex Feed Pumps.

Any of the above can be inspected and delivered at any time.

We have a large stock of Dynamos, Boilers, Pumps and miscellaneous machinery. Write us for details and lowest prices.

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42 inch Schellenback Pulley Lathe, Bores and turns simultaneously.

Portions of three shops for sale.

Write us your wants.

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For Immediate Delivery.

Engine Lathes, 10 in. to 32 in. swing.
Speed Lathes, 10 in. to 20 in. swing.
Shapers, 10 in. to 26 in. stroke.
Planers, 20 in. to 34 in.
Drill Presses, 10 in. to 28 in.
Mailing Machines, Hand and Power.
Screw Machines and Monitor Lathes up to 20 in.
Feed and Power Presses, a variety of sizes.
Drop Hammers with and without automatic lifts.
Hurlburt & Rogers Cutting-off Machines.
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Hoisting Engines.

19 New and second-hand Steam and Electric Hoists, 8 to 125 H.P. electric hoists.
32 Horizontal, Vertical and Portable Boilers, new and second-hand, 125 H.P. and smaller.
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Lot Derricks, Pile Hammers, Rails, Cars, etc.

CARLIN MACHINERY & SUPPLY CO.,
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FOR SALE—BARGAINS

50 H. Horizontal Tubular Boiler, guaranteed	$225
Belt Power Elevator and Platform	125
300 H. Austin Feed Water Heater	120
100 H. Receiving Tank, 150 lbs. test	60
16 x 6 " New Haven " Lathe	85
36 in. " Stevens " Pulley Lathe	75
16 in. " Huyett & Smith " Ventilating Fan	40
10 H. Upright Side Crank Engine, new	70
15 H. Submerged Flue Upright Boiler	70
No. 3 " Sturtevant " Blower	18
No. 1 " Sturtevant " Blower, new	12
Slate Sensitive Drill and Chuck	25
16 in. Upright Drill Press	15
20 in. x 20 in. x 4 ft. Iron Planer, not complete	80
12 H. Kimble Automatic Upright C. C. Engine	80
10 H. " Erie City " Upright Boiler, complete	75
15 H. Upright Boiler, complete with fittings	80
" Diamond " Emery Grinder	12
4 ft. x 15 in. Planer Chuck, heavy	15

Send for discounts.

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Special Bargains.

Second-Hand Tools.

LATHES.
3 12 x 4 Speed.
1 14 x 4 ft. 6 in. Putnam.
1 14 x 5 Putnam.
1 14 x 6 Putnam.
1 16 x 6 Pratt & Whitney.
1 16 x 6 Brown.
1 16 x 6 Harrington.
1 16 x 8 Somerset.
1 17 x 5 Wm. Gleason.
1 18 x 6 Fuller.
1 18 x 8 McMahon.
2 18 x 6 Pratt & W., plain.
1 18 x 7 Pratt & W., plain.
1 18 x 8 Pratt & W.
1 18 x 10 Am. T. & M. Co.
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1 20 x 8 Stover.
1 24 x 8 Bullard.
3 30 x 10 B'g'pt Chucking.
1 21 x 8 Dustin & Hubbard.
1 22 x 12 Fifield.
1 26 x 12 Lathe & Morse.
1 30 x 15 Fifield.
1 32 x 14 Pond.
1 34 x 19 Freeland.
1 50 x 16 Fifield
1 B'ment Single Axle Lathe

PLANERS.
1 18 x 18 x 40 Ames Screw
1 24 x 24 x 6 Putnam.
1 36 x 26 x 5 N.Y.S. Eng. Co.
1 60 x 60 x 20 Fitchburg.
1 14 ft. 6 in. Sellers Plate Planer.

DRILLS.
1 3-spindle Ames.
1 3-spindle Garvin.
1 20 in. Prentice, lever feed
1 25 in. Weeks & Halsey.
1 39 in. New Haven.
1 Bement & D. Upright.

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1 9 in. Crank, Bement.
1 12 in. Crank, Juengst.
2 15 in. fric., Hendey.
1 16 in. fric., Putnam.
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1 No. 3 P. & W., full auto.
1 No. 3 P. & W., wire feed.
1 14 in. Ames, wire feed.

MILLING MACHS.
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1 P. & W. Nut Tapper.
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1 No. 3 B. & S. Surface Grinder.
1 Valve Surfacer, Springfield.
1 30 in. Gould Semi Auto. Gear Cutter.
1 37 in. Baush & Harris Boring Mill.
1 Washburn Drill Grinder.
1 Garvin Screw Slotter.
1 12 in. Putnam Slotter.
1 Abbe Bolt Header.
1 Hor. Boring Mill, Bement & D.
1 Morton Keyseating Mch.
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Send for Special List.

MANNING, MAXWELL & MOORE,
85-87-89 Liberty St., N. Y. City.
Branches at Chicago, Pittsburgh and Cleveland.

FOR SALE—BAR MILL.

12-in. 3-high Bar Mill.
9-in. 3-high Bar Mill.
12-in. Cold Rolling Mill.
Corliss Engines coupled direct to trains.
Tubular and Waste-heat Boilers.
Heating Furnaces.
Shears, Saws, Cooling and Straightening Beds., etc.
5 acres of ground.
Building, 237 x 121 ft.
Brick Building for additions, 360 x 80 ft.
Connections with four railroads.

Above plant is located in thriving Ohio town.

W. J. CARLIN COMPANY,
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NEW YORK OFFICE:
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FOR SALE.

A complete Set of Blind Making Machinery.
1 Sash and Door Sticker.
1 Sash and Door Tenantor.
1 Door Sander.
1 Sash Mortiser.
1 Sash and Door Squeezer.
1 Two-Spindle Shaper.
1 Moulding Sticker.
Several hundred moulding knives.
1 10 H.P. Westinghouse Engine.
1 50 H.P. Stationary Engine and Boiler.
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1 80 H.P. " "
1 50 H.P. Portable " "
1 30 H.P. " "
1 6 H.P. " "
1 25 H.P. Motor; 1 2½ H.P. Motor; 1 1½ H.P. Motor
1 Blacksmith Bolt Header with new set of dies.
1 D.K. Dederick Perpetual Baling Press, as good as new.
3 Ensilage Cutters.
Write for prices. All of above will be sold cheap for cash.

F. R. PATCH MFG. CO., Rutland, Vt.

ENGINES AND SCREW MACHINE.

No. 5 Bardons & Oliver Screw Machine, good as new, $600.00. Has all cata. attachments and forming tool slide.
16½ x 32 Allis Corliss, box bed type; right hand, 10 years old, used very little and overhauled, $800.00.
38 in. Paper Cutter. Gauge Lathe. 3 2 H.P. Motors, etc.

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To Iron and Steel Manufacturers.

A first-class Holland firm wishes to represent an American house for the sale of iron and steel bars, plates, etc., etc. Address

"J C L," care *The Iron Age*, New York.

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No. 1, capacity 300 tons daily, now running, making over $5 per ton profit. Can be turned over promptly. Will pay half the cost this year.
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LAKE SUPERIOR (Mesaba) IRON ORE Lands.
Ready for operation August 1st.

TWO HUNDRED COKE OVENS AND Five Thousand Acres of Coal Lands in West Virginia.

FIFTY COKE OVENS AND COAL Lands on the Main Line of Pennsylvania Railroad.

CONNELLSVILLE COAL LANDS and Coke Ovens.

EIGHTY COKE OVENS AND CONNELLSVILLE coal in Connellsville region.

FIFTY THOUSAND ACRES OF COKING coal adjoining Connellsville region. Nine foot vein in Fayette and Greene Counties, Pa. These lands offer the best investments now before the American public.

COAL MINING PLANT AND COAL Lands in Virginia.
Capacity 25,000 tons per annum. Now shipping East and West. Modern electric equipment. Coal is like Pocahontas smokeless used in the United States Navy. Being exported.

FIFTY THOUSAND ACRES OF KENTUCKY Coal and Timber Land.
At a low price.

WELL-KNOWN IRON PROPERTY IN Kentucky
With well-developed ore mines and millions of tons of ore in sight and has also a large number of farms on the Cumberland and Tennessee Rivers. This property contains 40,000 acres and is a principality in itself.

MANUFACTURING PROPERTY IN the Monongahela Valley.

THICK VEIN COAL IN THE MO- nongahela Valley.
In the 3d, 4th, 5th, 6th and 7th pools of the Monongahela River.

SOMERSET COUNTY COAL LANDS.
In tracts of five, ten, twelve and seventeen thousand acres each, are cheap and are being sold rapidly to Eastern capitalists.

MANUFACTURING SITE AND COAL Lands on the Allegheny River.
On the Allegheny Valley Railroad is splendid property capable of prompt development.

CANADIAN IRON ORE MINES IN Operation.

A MODERN ROLLING MILL.

MANUFACTURING PROPERTIES and sites in Pittsburg and Allegheny Cities, Pa.

FIFTEEN THOUSAND ACRES OF coal in Centre and Clinton Counties, Pa., on the Beech Creek Railroad, suitable for shipment East.

TEN THOUSAND ACRES OF COAL on the main line of the Pennsylvania Railroad, containing four veins of coal, mostly above water. John Fulton, Mining Engineer of Johnstown, Pa., estimates over 80,000,000 tons of coal on this property. Will be sold cheap to a prompt buyer.

A FIRST-CLASS CHARCOAL BLAST Furnace.

For full information address

J. H. HILLMAN & SON,

Empire Building,

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FOR SALE.

Pair 14 x 36 Harris-Corliss; 24 x 56 Watts-Campbell; 13 x 12 and 2 11 x 12 New York Safety. 100 K. W. M. P., 3 800, 500, 300, 50 50-light dynamos. 2 20 H.P. crane motors, speed 500. 1 H.P., 220 volt motor, slow speed. 4 Sturtevant exhausters, 3 Buffalo blowers. Steam shovels, hoisting engines, crushers, coal mining machinery and contractors' equipment. **SEND DESCRIPTION** any machinery wanted or for sale.

CHESLEY MACHINERY CO., Havemeyer Bldg., New York.

CUPOLAS, CRANES, LADLES, BLOWERS,

and all other Foundry Equipment, new and second-hand. Send us list of your wants.

The J. D. Smith Foundry Supply Company,

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DESIRABLE MACHINERY

For Immediate Delivery.

BULLARD BORING MILLS.
30 in. Swivel Turret Head.
37 in. Double Head.
42 in. Swivel Turret Head.

GEAR CUTTERS.
33 in. Gould & Eberhardt, "Victoria" pattern.
43 in. " " "
36 in. Full Universal, Brainerd.

PLANERS.
24 in. x 24 in. x 6 ft. Pond, new pattern.
30 in. x 30 in. x 8 ft. Pond, new pattern.
36 in. x 36 in. x 10 ft. Cincinnati, two heads.
36 in. x 36 in. x 14 ft. Cincinnati, two heads.

ENGINE LATHES.
40 in. x 17 ft. Triple Geared.

RADIAL DRILLS.
No. 2 Bickford, Full Universal.
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No. 2 Back geared, plain.
No. 3 Cincinnati Universal, power feed in all directions.

SHAPERS.
26 in. Gould & Eberhardt Extension Base, power feed in head.

Send for complete list of tools in stock.
Send for our new catalogue giving full descriptions.

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PARTIAL LIST OF

SECOND-HAND MACHINERY

IN STOCK.

1 80 H.P. 60 in. x 16 ft. Tubular Boiler.
2 125 H.P. 66 x 18 Tubular Boilers.
1 100 H.P. Locomotive Boiler.
1 100 H.P. Baker Automatic 14 x 20.
1 100 H.P. Atlas Automatic Engine.
1 150 Buckeye Automatic Engine, size 16 x 18.
1 125 Buckeye Automatic Engine, size 14 x 16.
1 100 H.P. Ball Automatic Engine, size 13 x 12.
1 No. 12 Morris Centrifugal Sand Pump, direct connected to 12 in. vertical engine.
2 No. 6 Morris Centrifugal Sand Pumps.
1 16 x 16½ x 10 Worthington Duplex Pump.
1 12 x 12 x 10 Worthington Duplex Pump.
1 7 x 4½ x 10 Worthington Duplex Pump.
1 Deane Pupiex Power Pump, 5 in. plungers.

RAINIER & WILLIAMS,
64 So. Canal Street, Chicago, Ill.

FOR SALE.

One 50 H.P. Tubular Boiler, 1 10 H.P. Tubular, 1 10 H.P. Upright, 15 H.P.
One 10 H.P. Locomotive Boiler.
One 15 x 30 Hor. Engine 10 ft. x 16 in. Bal. Wheel.
One 11 x 20 " " 7 ft. x 14 in. " "
One 9 x 16 " " 6 ft. x 12 in. " "
One 10½ x 12 Centre Crank Armington & Sims Wheel Governor, two 5 ft. x 10 in. Bal. wheels.
One 6 x 10 Centre Crank Engine.
Write for prices.

HANNAN & FINTON, Springfield, Mass.

FOR SALE.

3 Steam Fire Engines, very cheap.

WALSH'S SONS & CO., Newark, N. J.

FOUNDRYMEN.

We have for sale a complete Foundry for making Stoves. Will sell whole or part.

The Thomas & Lowe Machinery Co.,
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FOR SALE.

18 x 42 Corliss Engine in A1 condition, also 80 H.P. New Era Gas Engine in excellent condition, which has been running only six months. Both ready for delivery about Oct. 1st. Can be seen during working hours. Apply

THE IRELAND & MATTHEWS MFG. CO.,
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FOR SALE.

Second-hand Steam Engines, Boilers and Pumps. Large variety of sizes and makers.

F. McSWEGAN & SONS,
Dover St. and Franklin Sq., New York.

Steam Hammers,

Second-Hand.

One 1500 lb. Ferris & Miles Double Frame Steam Hammer, with Crane.

One 1500-lb. Industrial Works Double Frame Steam Hammer, with Crane.

One 24-in. Stroke Beam Steam Hammer, with Crane.

McDOWELL, STOCKER & CO.,
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FOR SALE.

Three Bliss Power Presses, two No. 18, one No. 19C, all having 2 inch stroke, of latest pattern, nearly new and little used.

One Automatic Machine adapted to the rapid production of small articles of sheet metal or wire.

A Lot of Pickled and Cold Rolled Steel, No. 24 gauge, (.025) in sheets 28 x 101 inches.

Palmer Hardware Mfg. Co.,

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Second Hand Machine Tools, &c.

2-15 in. x 5 ft. Monitor Lathes, for brass work with counter shaft.
1-14 in. x 5 ft. Speed Lathes with counter shaft.
1-16 in. x 6 ft. Eng. S. C. Lathe with counter shaft. Ames' make.
1-20 in. x 13 ft. Eng. S. C. Lathe with counter shaft. Ames' make.
1-22 in. Blaisdell Drill.
1-24 in. Thorn & DeHaven Drill.
1-14 in. x 5 ft. Fox Lathe with Forming Tool, att.
1-Sprue Cutter, deep throat, 13 in., heavy.
4-Brass Furnaces, 24 in. x 36 in. (used 3 months).
1-Pattern Shop Wood Lathe, 14 in. x 7 ft. 6 in. Bed with counter shaft.

Apply to

NORTHERN ENGINEERING WORKS,
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FOR SALE.

Second Hand Machine Tools, Etc.

Two ten stamp belt driven Atmospheric Stamps.
One 30 in. Boring and Turning Pulley Lathe.
Defiance Balancing Machine.
One Shaft Straightening Machine, 28 ft. bed.
One double end Shaft Centering Machine.
One Garvin No. 2 Hand Milling Machine.
One (each) No. 3, No. 2 and No. 4 Dallett Portable Drill Presses.
25 to 200 H.P. Slide Valve Engines.
One New Compound Duplex Direct Acting Steam Pump, a million capacity.
Three Logging Locomotives.
Two 20 ton 41 ft. span Morgan Cranes with 480 ft. of 3½ in. square shaft and hangers.

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Milwaukee, Wis.

FOR SALE.

The English patent on new and most important Tool Machinery. For particulars, address

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care Rudolf Mosse, Stuttgart, Germany.

WANTED.

Second-hand Screw Punching Press, circular dies ⅝ in. to 3 in., square shears, for brass, 4 H. P. gasoline engine, plating outfit and various tools for light mfg. Spot cash for bargains.

CENTRAL TELEPHONE SUPPLY HOUSE,
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For Quick Delivery.

SINGLE VERTICAL PUNCHES.
30 in. throat, 1¼ in. in 1 inch plate.
30 in. throat, ¾ in. in. ⅛ inch.
24 in. throat, ¾ in. in. ⅛ inch.

SPLITTING SHEARS.
For ¾ in. and ⅛ in. plate.

DOUBLE ANGLE SHEAR.
For 4 x 4 x ⅝ in. angles.
Plate-edge Beveling Shear, for ¾ in. plate.
Gate Shear and Multiple Punch, 78 in.

BENDING ROLLS.
100 in. for 1¾ in. plate.
Hand Spacing Table, 8 ft.
Radial Drills, plain, 48 in. and 60 in. arm.
Boiler Makers' Flanging Clamps, 10 ft.
Steam Riveter, 6½ ft. gap.
Plate Planer, 6 ft. cut.
Duplex Vertical Engines, 9 x 9.

HILLES & JONES COMPANY,
Wilmington, Delaware.

Engine Bargains.

1 30 in. x 60 in. R. H. Hamilton Corliss, 15 in. shaft; 18 ft. fly wheel in 8 sections; rim 12 in. x 15½ in.
1 18 in. x 32 in. Single Cylinder Link Motion Double Drum with friction and brake band Haulage Engine, made by Webster, Camp & Lane.
The above engines are in A No. 1 condition.
For Sale by
WM. C. JOHNSON & SONS MACH'Y CO.,
St. Louis, Mo.

WILL SELL CHEAP

For Immediate Delivery.

One 26 x 48 Corliss Engine, 600 H. P.
One 14x14 Erie City Engine, Auto. 125 H.P.
One 12x18 Russell Auto. Engine, 100 H.P.

All in fine order and thorough repair.

One ¾ yd. Marion Steam Shovel.
One 3 ton McMyler Revolving Coal Derrick and 12 Buckets.

GEO. H. BOWLER,
513 Williamson Building, - - CLEVELAND, O.
We want to Buy Machinery for Cash.

FOR SALE.

ENGINES, SLIDE VALVE.
1 Pair Twin 12 x 18 McCune.

ENGINES, AUTOMATIC.
1 12 x 20 Atlas.
1 16 x 24 "
4 11 x 11 Westinghouse.
1 16 x 24 Warren.

BOILERS.
1 72 x 16, 3½ in. flues.
4 72 x 14, 4 in. flues.
1 50 H.P. Upright.
2 12 in. Shafts, 24 ft. long, with couplings.
1 13 in. Shaft, 24 ft. long, with couplings.
Tubing, Rods and Oil Well Casing.
Second-hand Flues, all sizes, cleaned and cut to length.
100,000 ft. Standard Pipe, all sizes.
1 500 light Electric Machine.

McDOWELL & CO.,
347 Fifth Ave., Pittsburgh, Pa.

FOR IMMEDIATE DELIVERY.

One 36 in. x 36 in. x 12 ft. NILES PLANER; two heads; good order.
One 30 in. x 30 in. x 10 ft. SELLERS PLANER; good order.
One 84 in. x 20 ft. ENGINE LATHE; good order.
One 36 in. x 24 ft. NEW HAVEN ENGINE LATHE; good order.

All of the above can be delivered immediately, and will be sold at low prices.

Large stock of heavy tools on hand. Send for new list.

WM. A. READE & CO.,
216-217 American Trust Bldg., Cleveland, O.

WANTED TO BUY.

One Engine and Boiler, 75 to 100 H.P. Must be in good condition; also one Universal Wood Working Machine.
TENNESSEE HARNESS CO.,
Nashville, Tenn.

Second-hand Tools

For Immediate Delivery.

1 800 lb. Merrill Drop Hammer.
1 14 in. x 60 in. Pratt & Whitney Shaping Machine.
1 12 in. x 60 in. Bement Shaping Machine.
1 10 Pratt & Whitney Tool Room Lathe.
1 No. 3 Stiles Punching Press.
1 No. 3 Fowler Press.
1 54 in. x 19 ft. Planer, double head.
1 60 in. Heavy Radial Drill, 4 spindle.
1 Small Horizontal Boring and Drilling Machine, Bement.
1 No. 13 Brown & Sharpe Milling Mach.
1 No. 1½ Pratt & Whitney Hand Milling Machine.
1 No. 2½ Newton Duplex Milling Mach.
2 No. 5 Cleveland Auto. Screw Machines.
1 Lodge & Davis Screw Machine, 2 in.
1 No. 2 Jones & Lamson Screw Machine.
2 36 in. Hydraulic Wheel Presses.
1 16 in. Slotting Machine

U. Baird Machinery Co.

123-125 Water St., 124-126 First Ave.,
PITTSBURGH, PA.

FOR SALE.

One 150 H.P. Cross-compound Armington & Sims Auto. Engine, cylinders 11½ and 18½ x 15.
One 13 in. x 12 in. Phoenix Auto. Engine.
One 12 in. x 24 in. Wetherill Corliss Engine.
One 12 in x 36 in. Babcock and Wilcox Engine.
One 8 in. x 10 in. Atlas Auto Engine, center crank.
One 12 in. x 7 in. x 10 in. Worthington Duplex Pump.
One 1000 lb. Ferris and Miles Steam Hammer.
Also a number of smaller Engines and Pumps.
THE E. H. WACHS CO., 158 Indiana St., Chicago.

HAMMER FOR SALE.

One Cleveland Helve Hammer; weight of head and die 2,500 pounds, total weight about 50,000 pounds; 26 inch steam cylinder. In good order. Suitable for slabs, axles, etc., for railroad or general work.

COOKE LOCOMOTIVE & MACHINE COMPANY,
Paterson, N. J.

FOR SALE.

For immediate delivery, a 10-ton Hand Power Crane in first-class condition, made of 9 in. channel iron; length of jib 30 ft. 6 in.; wrought iron mast, 14 in. diam. at base, 14 ft. 6 in. in height under jib; cast iron base plate, 6 ft. square. Inquire

VULCAN FOUNDRY & MACHINE CO.,
New Castle, Pa.

HORIZONTAL ENGINES.

One 26 in.-12 in. x 48 in. Weisel & Vilter Corliss, Horizontal, Cross-compound.
One 22 in.-32 in. x 42 in. Allis Corliss, Hor., Tandem-compound.
One 19 in.-32 in. x 44 in. Hoffman & Billings Corliss, Hor., Tandem-compound.
One 18 in.-26 in. x 42 in. Allis Corliss, Hor., Tandem-compound.
One 6 in.-30 in. x 42 in. Allis Corliss, Hor., Tandem-compound.
Two 16 in. x 36 in. Allis Corliss, Hor., Simple Engines.
One 16 in. x 16 in. Ball Automatic Engine.
One 13 in. x 12 in. Payne Automatic Cut-off, Hor., Center Crank Engine.
One 13 in. x 14 in. Standard Westinghouse Automatic Engine.

TUBULAR BOILERS.

Three Horizontal Tubular, 66 in. x 16 ft., Boilers.
Three Horizontal Tubular, 72 in. x 16 ft., Boilers.
Two Horizontal Tubular, 60 in. x 16 ft., Boilers.
Three Horizontal Tubular, 60 in. x 16 ft., Boilers.
Two Horizontal Tubular, 48 in. x 14 ft., Boilers.
One Horizontal Tubular, 36 in. x 12 ft. Boiler.
Send for our complete stock list.

WISCONSIN MACHINERY CO.,
125-127 W. Water St., Milwaukee, Wis.

FOR SALE.

Tools lately in use in Boiler Manuf'g Plant.

1 40-ton 36 in. Gap Hydraulic Riveter.
1 set 20 ft. Niles Rolls.
1 13 in. x 22 in. x 13 in. Westinghouse Engine.
1 18 in. x 54 in. x 18 in. Barr Pump for 500 lbs. pressure.
For additional information, address

ESTATE OF WM. G. WARDEN,
1012 Witherspoon Bldg., Philadelphia.

Machinery Bargains.

24 x 48 Hamilton Corliss Engine.
24 x 24 ft. Shafting Lathe.
14 x 30 Cummer 4-valve Automatic Engine.
14 x 14 Sutton Marine Engine.
Two 12 x 11 and one 9 x 9 Westinghouse Engine.
11 x 11 Ide Vertical Engine.
8 x 16 Rice Automatic Engine.
600 H.P. Rowe Feed Water Heater.
200 H.P. Berryman Heater.
200 H.P. Reynolds Heater.
200 H.P. Stillwell-Bierce Heater.
70 H.P. Otis Steel Fire Box Boilers.
75 feet Double Leather Belt, 22 in.
15 H. P. Gasoline Engine.
90 H. P. Waste Heat, Vertical Boiler.

The above are all in first-class condition and ready for shipment.

A. L. DAWSON & CO.,
27-31 W. Washington St., Chicago, Ill.

FOUNDRY PLANT

for sale or rent. Large capacity; fully equipped and now in operation. Railroad facilities excellent; two belt and one trunk line. Outside Chicago.

Address "FOUNDRY PLANT."
Care *The Iron Age*, 1205 Fisher Building, Chicago, Ills.

Wanted to Make

We have a complete modern manufacturing plant near Boston, equipped with **Power Presses, Automatic Screw Machines, Nickel Plating and Polishing Plant** and want to correspond with parties having articles that can be made in such a factory. Address

"W.,"

care *The Iron Age*, 70 Kilby Street, Boston, Mass.

Machinery Bargains.

34 in. Planer, 15 ft. table, Fairbanks.
32 in. Lathe, double head, 5 ft. between centers.
15 in., 16 in., 17 in. and 18 in. Lathes, 6 ft. to 8 ft. beds.

A. V. KAISER & CO,
222 South Third St., Philadelphia.

FOR SALE AND PROMPT DELIVERY.
35 lbs. Steel T Rails, El Paso, Tex., delivery.
45 to 48 lbs. Steel T Rails, Washington, D. C., delivery.
56 lbs. Steel T Rails for delivery between Buffalo and Chicago on line of Nickel Plate R. R.
60 lbs. Steel T Rails, Chicago and Kansas City delivery.
62 lbs. Grooved Girder Johnson Steel Rails, Washington, D. C., delivery.
83 lbs. Grooved Pennsylvania Steel Girder Rails with bolts, nuts and chairs for Chicago delivery.
350 tons of new 25 to 45 lbs. Steel T Rails, Chicago delivery.
Material subject to inspection at points of shipment.

BLOCK-POLLAK IRON CO.
No. 923 Marquette Bldg., Chicago, Ill.

Second-hand Machinery For Sale.

Engines, Boilers, Pumps, Heaters, Iron and Wood Working Machinery, all makes, all kinds. Shafting, Pulley Hangers, Boxes, etc. Mining, Cupola and Forge Blowers. We make a specialty of Saw and Planing Mill Machinery.

HARRIS MACHINERY CO.,
1045 Washington Ave., S. E., Minneapolis, Minn.

Bargains in Presses.

All Kinds of Metal Working Presses Bought, Sold and Exchanged.

T. W. G. COOK, 2-4-6 Reade St., N.Y.

Geared Die Cutting Power Press, platen 20 x 36.
Bliss Drop Press 17½ in. bet. uprights, 500 lb. Hammer.
Bliss Drop Press, 12 in. bet. uprights, 350 lb. Hammer. Both have Peck automatic lifts.
2 deep throat Power Presses, 1½ in. throw, 300 lb. Wheels.
2 open back Power Presses, 1 in. thrown, 100 lb. Wheels.
1 Ferracute No. 51 Power Press, 1 in. throw, 250 lb. Wheels.
1 Farrell Power Press, 1½ in. throw, 75 lb. Wheels.
1 self feeding Power Press, 1 in. throw, 100 lb. Wheels.
12 Foot Presses, large beds and opening in beds.
18 " " weighted compound levers.
10 " " knuckle joint for bench.
15 Open Front Screw Presses, and many others.

FOR SALE.

SPECIAL ENGINES.

1 14 in. x 20 in. (Vertical) Slide Valve.
•1 14 in. x 30 in. Keystone Corliss (Brand new).
•1 11 in. and 9 in. x 24 in. Tandem Comp'd "Buckeye" (latest type) with condenser.
†1 22 in. x 42 in. Wetherill Corliss.
•1 23 in. x 48 in. Geo. H. Corliss make.
1 24 in. x 36 in. Mackintosh, Hemphill & Co.
1 36 in. x 60 in. Tangye Bed type.
1 Crane Elevator Co. Modern Elevator Engine.

BOILER.

1 Horizontal Tubular, 72 in. x 16 ft., with 84 3½ in. tubes, approved for 100 lb. pressure, complete.

SHAFTS and PILLOW BLOCKS.

15 Very fine forged Shafts, finished all over, 10 in. diam. to 16 in.

FLY WHEELS. For Balance and for Belts.

SMOKE STACK.

Very fine steel self-supporting stack, 64 in. diam., 100 ft. high, with base casting, ornamental top and ladder.

HAMMERS.

1 Hackney Cushion Hammer.
1 1200 lb. Double Frame Steam Hammer.
1 4 ton do.

SHEARS.

1 New Alligator Shear with capacity up to 2½ in. Cold Billets, or for Scrap cutting. Knives 14 in. long.

LOCOMOTIVES, New and Second-Hand.

•Signifies Right-hand.
†Signifies Left-hand.

B. M. EVERSON.

German Nat. Bank Bldg. (6th and Wood), PITTSBURG, PA.

Sales Agent for Baldwin Locomotive Works, Phila.

WE WANT

HEAVY CAST MACHINERY SCRAP AND OLD IRON BOILERS.

Send full description of material with lowest price, New York Delivery.

GRANT & WILLIAMS,
Park Row Bldg., New York.

For Sale Cheap.

7 Contractors' Plows, No. 99 "Syracuse."
6 Contractors' Plows, No. 1 "Syracuse."
1 Portable Saw Mill, complete.
1 6 in. Centrifugal Pump.
3 Gleason & Bailey Pumps, No. 2.
3 Derrick Hoists.
5 No. 1 Jenne Jacks.
50 Two Wheel Road Scrapers, Western Wheel Scraper Co.
6 Narrow Gauge Dump Cars, 36 in.

SMITH & CAFFREY,
Syracuse, N. Y.

---

2 300-H.P. Boilers, 2 High Speed Engines, 2 Dynamos, 100 kilowatts, each plant complete. 3 1500-H.P. Corliss Engines. 1 12-H.P. Erie Engine. 8 125-H.P. Horizontal Tubular Boilers. 3 20-H.P. Upright Boilers. 1 300-H.P., 1 3000 Feed Water Heaters. 1 Hydraulic Riveting Machine, 86-in. gap. 1 Boiler Plate Planer, 16 ft. long, very heavy. 1 Power Shears, 1 Double Arbor Milling Machine, 1 48-in. Swing Lathe, short bed. 1 Horizontal Boring Machine. 3 new Woodward Pumps, several small Lathes, large lot Leather Belting.

ROBERT J. GRAY,
52-54 East 132d St., New York.

TWO IRON BRIDGES.

Each of two spans 124 feet, with a draw span of 350 feet and 260 feet; these are railroad bridges, comparatively new; were taken out because too light for new heavy rolling stock. Will make splendid wagon bridges; will sell all together or separate spans; terms to suit.

JEFFERSON IRON CO.,
First Ave. and 27th St., P. O. Box 597, Birmingham, Ala.

FOR SALE.

Atlas-Corliss Engine, 18 x 48, in running order. Delivery at once. Price low.

THE CRANE & BREED MFG. CO.,
Cincinnati, Ohio.

CAR COUPLERS.

Advertisers have large experience as makers of Malleable Castings, have a well equipped plant and wish to make arrangements with the owner of an accepted coupler to make it for them or to market it outright. Refereuces exchanged.

Address "COUPLER,"
Care *The Iron Age*, New York.

FOR SALE.

One Pond Planer, 36 x 36 x 17 ft.

One New Have Lathe, 25 in. swing, 16 ft. bed.

One vertical Engine 14 x 14, roughtry valve, self contain.

One Sturtevant Steel Blower, 68 in. high, 26 inlet, 22 outlet.

Also one Atlas 10 x 12 Engine.

Also a large lot of iron tanks.

WM. ECKBOLDS' SONS,
711 E. Girard Ave., Philadelphia.

FOR SALE.

One Corliss Engine, 26 in. x 60 in., fly wheel 20 ft. diameter, section of rim 15½ in. x 11 in. One Multiple Drill Press, four spindles, 8 ft. between housings, built by Messrs. Bement, Miles & Co., for drilling holes in plates.

Five trains of plate rolls. One 9 ft. Fly wheel, new, 7 in. bore, weight 6000 lbs. Two Bliss Guillotine Upright Shears, 72 in. gap, 3 in. stroke. One Deane Duplex Pump, 6 x 5½ x 6. One Rod Straightening Machine, built by the Medart Patent Pulley Co. for straightening rods up to 3 in. diameter and 25 ft. long. A lot of extra cold and hot plate rolls (new) and numerous other items from the Olney Copper Plant.

HENRY A. HITNER'S SONS,
Gaul and Sargeant Sts., Philadelphia.

MACHINERY.

SECOND-HAND, FIRST-CLASS ORDER

3-16 in. Adt. Rotary Wire Straightener, five dies, with loose pulley on stand.
25 lb. Justice Power Hammer.
50 lb. Power Hammer (Dinelt & Eisenhardt).
25 lb. Bradley Helve Hammer.
40 lb. Bradley Helve Hammer.
500 lb. Merrell Board Lift Auto. Drop Hammer.
1500 lb. Morgan & Williams Double Standard Steam Hammer.
800 lb. Pratt & Whitney Board Lift Automatic Drop Hammer.
No. 7 Jarecki Pipe Machine.
2½ in to 12 in. Curtis & Curtis Pipe Machine.
3-16 in. Adt style "D" Riveting Machine.
Garvin Single Spindle Profiler.
No. 1 Warner & Swasey Screw Machine with wire feed.
No. 3 Pratt & Whitney Screw Machine with wire feed.
No. 1 Bliss Foot Press.
Brown & Sharpe Polishing and Finishing Lathe.
No. 2 Plain Milling Machine (Reed).
No. 3 Hand Milling Machine (Garvin).
No. 8 Milling Machine (Brainard).
No. 4 Milling Machine (Brainard).
No. 2 Diamond Wet Tool Grinder.
No. 5 Niagara Slitting Shear.
18 in. throat Power Punch.
5½ in. throat Power Shear.
24 in. throat Power Shear.
14 ft. Boiler Plate Planer.
No. 86 Niagara Bench Screw Press.
6 in. Boynton & Plummer Shaper.
15 in. Hendy Shaper.
18 in. Juengst Shaper.
15 in. Garvin Spinning Lathe.
10 in. and 13 in. Sensitive Drills.
20 in. Barnes Drills.
Plating Dynamos from 300 to 700 gallons capacity.
Plating Tanks.
14 in., 16 in., and 21 in. Engine Lathes.

NEW.

Engine Lathes 12 in. to 38 in. Swing, various lengths of bed.
10 in. to 40 in. Drill Presses, standard makes.
Nos. 1, 2 and 3 Cincinnati Full Univ. Mill'g Machs.
No. 2 Cincinnati and No. 2 Hisey Plain Mill'g Mchs.
36 x 36 x 12 ft. Gray Planer with two heads.

Write us for any machinery wanted, or what you may wish to exchange or sell.

C. C. WORMER MACHINERY CO.,
Ft. of Shelby Street, Detroit, Mich.

FOR SALE.

One Hundred Open Top Square Iron Tanks. Mounted on wheels. Capacity of each, 22 cubic feet, or 166 gallons. For blue prints and prices send to

M. P. COLEMAN,
77 Haverhill St., Boston.

WANTED, PUNCHING MACHINE.

Long & Allstatter's Single or Double; Nos. 4, 5, 6, or 7; equally as good make will do.

THE STEWART IRON WORKS,
CINCINNATI, OHIO.

FOR SALE,

SECOND HAND TOOLS.

Three "Bryant" Cold Saws.
One "Whitcomb" Planer, 37 in. x 36 in. x 9 ft.
One "Cockburn" Concrete Mixer.
One "Sturtevant" Blower, No. 8.
One do. do. No. 5.
Two Horizontal Tubular Boilers, 66 in. x 16 ft. with 90 three-inch tubes, now running under 80 lbs. pressure.

ALSO

NEW CORNELL BLOWERS—Poole's patent, all sizes—the best in the market—send for prices.

J. B. & J. M. CORNELL,
26th St. and 11th Ave., New York City.

Where to Locate.

Manufacturers using iron, steel or wood will find the best locations for successful plants along the

SOUTHERN RAILWAY.

These locations lead in cheap raw material, cheap, contented and desirable labor, cheap fuel and in good facilities for marketing products. Opportunities now open for establishing new plants are fine and should be investigated. Other investments will prove profitable in the South.

M. V. RICHARDS,
Land and Industrial Agent, Southern Railway,
WASHINGTON, D. C.

FOR SALE.

No. ¼ Root Blower in good order		$ 45
" 1 " " " "		95
" 2 " " " "		125
" 4 " " " "		280
" 5 " " " "	Engine and Bed plate	675
No. 6 Root Blower, Engine and Bed plate		800
8 horse Portable Engine and Boiler, complete		150
15 " Vertical Greenfield Engine,	"	165
15 " Hor. Payne Auto.	" "	195
30 " Vertical Boiler, complete		125

A. ASHER,

109 Liberty Street, 2nd Floor, - - - New York.

WANTED.

200 ft. 12 in. Steam Pipe; one Scrap Shears to cut scrap up to 16 in. in width by ½ in.; one Railroad Track Scale at least 35 ft. long; one Cropping Shear to cut plates 40 in x ½ in. All the above must be in first-class condition. In replying give price and photo. of shears, if possible. Address

"B. H. G.,"
care *The Iron Age*, 117-119 So. 4th St., Phila., Penna.

AN AGENT OF MANUFACTURERS OF FRENCH PRUNERS

of the best marks is open for an agency of American horticultural tools and implements or analogous articles in ironmongery. High class references will be given. Apply to

H. JOUBERT,
14 Rue Crussol, Paris.

$100,000.

I have contracted with large incorporated company, near Pittsburgh, in independent, profitable line to build new steel works and obtain control. A prudent, active man is desired, with $100,000 to $200,000 on security, to join promptly and take important official position. Address "PRINCIPAL," Office of *The Iron Age*, Hamilton Bldg., Pittsburgh, Pa.

Bargains in Machinery and Supplies.

We Are Constantly Buying Entire Factories and Plants.

Among our more recent purchases, we briefly mention the following:

FROM THE SIOUX CITY TRACTION CO.

No. A 289 2 13x22x12 Westinghouse compound engines
No. A 290 1 pair 17¾x24 Williams automatic engines, coupled together
No. A 291 2 generators, type U. S. Westinghouse bi-polar, size 80 k.w.
No. A 292 2 60x16, horizontal tubular boilers
No. A 293 1 450-H.P. Hazelton water tube boiler, two Roney furnaces with stokers
No. A 294 1 Wortington duplex pump, 6x4x6
No. A 295 1 Koerschell heater, 2x9 ft.
No. A 296 1 Hancock inspirator, 1¼ in.
No. A 297 38 ft. 6⅞ in. shafting
No. A 298 39 ft. 8 in. shafting
No. A 299 8 ft. 4⅞ in. shafting
No. A 300 15 ft. 10 in. shafting
No. A 301 2 6⅞ in. flanged couplings
No. A 302 1 8 in. flanged coupling
No. A 303 1 6⅞x4¾ flanged coupling
No. A 304 1 60x38x6⅞ in. double arm drive pulley
No. A 305 4 60x16x6⅞ in. Hill friction clutch pulleys
No. A 306 1 60x28x6⅞ in. iron pulley, leather covered face
No. A 307 1 60x16x4⅞ in. iron pulley
No. A 308 1 14 ft. x 43 in. x 8 in. iron pulley
No. A 309 2 6¾x20 chain oiling pillow blocks
No. A 310 5 6¾x15 chain oiling pillow blocks
No. A 311 1 4¾x15 chain oiling pillow blocks
No. A 312 1 72x26x8 Dodge wood pulley
No. A 313 2 14 ft. x 16 in. cable drums, six grooves for 1¼-in. cable
No. A 314 1 12 ft. x 17 in. x 15 in. spur gear
No. A 315 10 8x18 in. pillow blocks
No. A 316 2 double ply dynamo belts, 16 in. width, 57 ft. long
No. A 317 1 double ply dynamo belt, 14½ in. width, 71 ft. long
No. A 318 1 double ply dynamo belt, 14½ in. width, 48 ft. long
No. A 319 1800 ft. 10-in. black wrought iron pipe

FROM EXCELSIOR BRASS WORKS, DUBUQUE, IA.

We purchased their complete factory outfit, and to purchasers interested in brass work, we can offer some exceptionally good bargains. At this writing we have no complete list of all the different items contained in this works, but they approximately consist of the following:

No. A 320 1 80-H.P. engine
No. A 321 1 90-H.P. boiler
No. A 322 27 turret lathes
No. A 323 grinding machines
No. A 324 polishing machines
No. A 325 up to date patterns for brass works, shafting, hangers, couplings, pulleys, belting, fine reamers of all kinds

Clayton's condensing air compressor complete with tank and fittings of all kinds. Interested inquirers will be furnished with complete description on application.

FROM ARMOUR & CO., CHICAGO,

all the boilers formerly used in their plant. They are all in excellent condition, and have only been taken out because of a change in their motive power from steam to electricity. There are 70 in all, 48 of them 60x18 and the balance 54x16 and 60x16. They are types of the finest boilers ever installed in any plant, and we will thoroughly overhaul and place in as good condition as they were when new.

HASTINGS, NEB., ELECTRIC PLANT.

No. A 326 1 9½x12 Armington & Sims engine
No. A 327 2 650-light incandescent dynamos
No. A 328 2 25-light Ball arc dynamos
No. A 329 2 60x16 horizontal tubular boilers
No. A 330 2 66x16 horizontal tubular boilers
Shafting, hangers, couplings, &c.

FROM ILLINOIS STEEL CO.

No. A 331 2 double shears, cut up to 5 in. round
No. A 332 6 60x16 horizontal tubular boilers
No. A 333 1 crane, with 20-ft. swing and 10-ton chain hoist
No. A 334 1 60-ft. traveling crane
No. A 335 railroad, wagon and warehouse scales, over 200 in all

ENGINES.

No. A 20 3x5 upright
No. A 21 3½x2½ Kane, marine
No. A 23 4x4 self-contained Westinghouse
No. A 24 4x6 upright
No. A 26 5x7 Willard horizontal
No. A 196 6x10 Rice automatic
No. A 197 6½x8 Am. hoisting complete
No. A 27 7x10 center crank
No. A 28 7x12 on wheels
No. A 29 7x12 traction
No. A 198 7x14 Ames cylinder
No. A 199 7½x14 stationary, Wood, Moore & T.
No. A 200 8x10 Otis furnace hoist
No. A 30 8x12 Lansing horizontal
No. A 195 8x12 automatic, left hand, side crank
No. A 31 8x16 Russell Gibbs
No. A 32 8x24 stationary
No. A 201 9x9 Racine automatic
No. A 34 9x12 center crank
No. A 36 9x16 Stedman
No. A 37 9½x12 Armington & Sims automatic
No. A 38 9½x16x14 Payne compound
No. A 40 10x12 double hoisting
No. A 41 10x12 upright Fritz
No. A 42 10x12 Watertown side crank
No. A 44 10x16 Erie ball
No. A 45 10x18 center crank
No. A 46 10x24 center crank
No. A 47 10x20 center crank
No. A 48 10x20 Atlas
No. A 49 10x18 stationary
No. A 50 10½x18 stationary
No. A 51 11x12 automatic Westinghouse
No. A 52 8x12 pair Atlas
No. A 53 11x20 Atlas automatic
No. A 54 11x18 stationary
No. A 203 11x22 rt. hd, slide valve
No. A 55 12x12 Ideal
No. A 57 12x12 Atlas
No. A 58 12x16 balance valve
No. A 202 12x18 Houston, Stanwood & Gamble
No. A 59 12x18 Lansing
No. A 60 12x20 Sinker & Davis
No. A 61 12x20 upright
No. A 204 12x20 Westinghouse automatic
No. A 62 12x12 center crank
No. A 63 12x20 horizontal tangye
No. A 64 12x20x12 Westinghouse automatic compound
No. A 65 12x20x14 Ball automatic compound
No. A 66 12x24 Zeahm Bros.
No. A 67 12x20 horizontal slide valve
No. A 205 13x16 Twin engines, tandem bed
No. A 70 13x16 horizontal side crank
No. A 71 13x18 four valve Russell automatic
No. A 72 13x20x15 Armington & Sims cross compound condensing
No. A 73 13x16 Erie horizontal
No. A 74 14x14 automatic Ideal
No. A 75 14x24 Richards horizontal
No. A 76 14x24 box bed
No. A 77 14x20 Atlas automatic
No. A 78 14x24 Bay State
No. A 278 14x30 Cumner
No. A 79 14½x13 Armington & Sims automatic
No. A 80 15x14 automatic Ideal
No. A 81 16x14 Smith, Beggs & Rankin automatic
No. A 207 16x36 Woodruff & Beach
No. A 208 17¾x24 pr. auto. Williams, coupled
No. A 82 18x30 250-H.P.
No. A 83 20x22 Corliss
No. A 84 20x36 Corliss
No. A 85 20x42 Corliss
No. A 86 26x48 Corliss
No. A 87 20x24 horizontal, box bed
No. A 209 66x20 Chandler & Taylor
No. A 210 40-H.P. Rice automatic
No. A 211 35-H.P. Chandler & Taylor
No. A 88 22x42x48 Alice tandem condensing
No. A 89 14x20 Russell automatic
No. A 90 10-H.P. Davis & Rankin
No. A 91 10-H.P. slide valve
No. A 92 40-H.P. slide valve
No. A 93 60-H.P. slide valve
No. A 94 20-H.P. Milburn
No. A 95 No. 874 Racine automatic, 9-in. stroke
No. A 96 80-H.P. Farquhar
No. A 97 No. 1 Russell high speed automatic
No. A 98 12-H.P. Giant
No. A 99 14-H.P. Giant
No. A 100 6-H.P. automatic Westinghouse
No. A 101 10-H.P. gas engine
No. A 102 13-H.P. Dayton gasoline
No. A 103 35-H.P. upright
No. A 104 40-H.P. Otto gas
No. A 105 50-H.P. Otto gas
No. A 106 19-H.P. Lewis gasoline
No. A 107 50-H.P. Raymond gasoline
No. A 172 68-H.P. Atlas
No. A 173 10x20 side crank
No. A 174 Otis furnace hoist engine, 2 cyl., 8x10
No. A 177 13x16 Twin engines, tandem bed
No. A 179 7x14 Ames cylinder
No. A 273 16x30 balance wheel, 14 ft. diam.
No. A 274 1-H.P. gasoline
No. A 275 16½x30 Buckeye
No. A 276 6x12 horizontal slide valve
No. A 277 14x28 horizontal slide valve
No. A 278 12x24 marine oscillating
No. A 279 30x30 slide valve
No. A 280 36x42 slide valve
No. A 281 24x30 slide valve
No. A 282 10x15 center crank
No. A 283 6x8 box bed, side crank
No. A 284 16x36 Sinker & Davis
No. A 285 9x9 upright, center crank
No. A 286 9x14 horizontal, side crank
No. A 287 9x12 Nagel
No. A 288 7x7 side crank

PUMPS.

Over 250 different styles and sizes. Here's a few. Get complete list:

No. AH 47 1 Delamater single acting, steam cyl. 4 in.
No. AH 48 1 Cameron single acting, steam cyl. 4 in.
No. AH 49 1 Cameron single acting, steam cyl. 4½ in.
No. AH 50 1 Deane single acting, steam cyl. 4 in.
No. AH 51 1 Blakeslee single acting, steam cyl. 3 in.
No. AH 52 1 McGowan duplex, steam cyl. 4 in.
No. AH 53 1 Davidson single acting, steam cyl.
No. AH 54 1 Hooker single acting, steam cyl. 3½ in.
No. AH 55 1 Blakeslee single acting, steam cyl. 4 in.
No. AH 56 Gorden & Maxwell duplex, steam cyl. 3½ in.
No. AH 57 1 Wells single acting, steam cyl. 3½ in.
No. AH 58 Norwalk single acting, steam cyl. 5 in.

BOILERS.

No. A 108 3 72x10 horizontal tubular
No. A 109 12 64x14 horizontal tubular
No. A 110 5 48x16 horizontal tubular
No. A 111 9 48x14 horizontal tubular
No. A 112 4 56x14 horizontal tubular
No. A 113 5 54x15 horizontal tubular
No. A 114 3 63x16 horizontal tubular
No. A 115 2 60x14 horizontal tubular
No. A 116 1 44x14 horizontal tubular
No. A 117 2 66x16 horizontal tubular
No. A 118 1 34x10 horizontal tubular
No. A 119 6 36x30 cylinder
No. A 120 1 48x28 cylinder
No. A 121 1 40x20 cylinder
No. A 122 1 40x26 cylinder
No. A 123 2 36x24 cylinder
No. A 124 4 48x22 cylinder
No. A 125 1 26x10½ locomotive fire box
No. A 126 1 32x11 locomotive fire box
No. A 127 36x7 vertical
No. A 128 1 30x5 vertical
No. A 129 1 75-H.P. Hazelton
No. A 178 1 12 ft. Ames portable
No. A 130 4 44x21 2-flue 14 in.
No. A 131 3 48x28 2-flue 16 in.
No. A 132 1 40-H.P. steel tubular
No. A 133 1 marine fire box 9 ft. diam., 18 ft. long
No. A 134 1 marine fire box 7 ft. diam., 18 ft. long
No. A 135 1 25-H.P. Milburn
No. A 136 1 24x4 upright

COMBINED BOILERS and ENGINES.

No. A 142 1 combined Davis & Rankin 8-H.P.
No. A 143 1 10x14 engine boiler, 12 ft. long
No. A 144 1 25-H.P. portable engine and boiler
No. A 145 1 10 or 12 H.P. Altman traction engine and boiler
No. A 146 1 20-H.P. portable engine and boiler, made by Frisby & Logue
No. A 147 1 9½x16 fire box boiler and engine
No. A 148 1 10x15 Baxter combined engine and boiler
No. A 149 1 8-H.P. combined
No. A 150 1 25-H.P. combined portable
No. A 151 1 hoisting engine and boiler, 6x12, made by Kendall & Bro.
No. A 152 1 hoisting engine and boiler, 10-H.P., cylinder 3½x5
No. A 153 1 hoisting engine and boiler, cyl. 6x6
No. A 154 1 combined locomotive boiler and engine on skids, 10 ft. over all, cyl. 5½x12
No. A 155 1 Baxter combined engine and boiler, cyl. 7x6
No. A 156 1 combined B. & B. 24x48, engine cyl. 4x6
No. A 157 1 combined Triumph No. 3, manufactured by Rice & Whitacre
No. AP 82 2 7x10 four-drum Lidgerwood hoisting outfits
No. AP 82½ 1 7x10 four-drum Lidgerwood hoisting outfit
No. AP 82¾ 2 5½x8 four-drum Lidgerwood hoisting outfits

MISCELLANEOUS ITEMS

No. A 158 1 30-in. double jet water motor
No. A 159 1 Stillwell-Pierce open heater 24 in. x 5 ft.
No. A 161 1 bending machine, made by Williams, White & Co.
No. A 162 1 No. 1 washer machine, made by York & Smith
No. A 163 1 bolt header, ½ to 1 in., made by Oliver Bros.
No. A 164 1 screw cutting machine, ⅜ to 1¼ in.
No. A 165 1 nut tapper
No. A 167 1 25-light dynamo, Simpson El. S. Co.
No. A 168 3 Amer. turbine water wheels
No. A 169 2 42x36 in. x 8 ft. horizontal spindle milling machines
No. A 175 1 Gates No. 2 stone crusher
No. A 180 1 large McGowan condenser, steam cyl. 8 in.
No. A 182 1 Ames lathe, 8-ft. bed, 30-in. swing
No. A 183 1 lathe, 6-ft. bed, 18-in. swing
No. A 184 1 lathe, 6-ft. bed, 20-in. swing
No. A 185 1 Putnam lathe, 12-ft. bed, 24-in. swing
No. A 186 1 lathe, 6-ft. bed, 16-in. swing
No. A 187 1 Wheeler lathe, 6-ft. bed, 14-in. swing
No. A 188 1 metal lathe, 3-ft. bed, 8-in. swing
No. A 189 1 lathe, 6-ft. bed, 16-in. swing
No. A 190 6 tumblers or bolters
No. A 194 1 hand power pipe threading machine, will thread up to 5 in.
No. AH 157 2 turbine water wheels, 36-in. diam.
No. AH 159 1 power ventilating fan, Huyett & Smith, 48-in. diam.
No. A 271 1 Leffel water wheel
No. A 272 1 Jones water wheel

Catalogue No. 78 Sent on Request. This List is only a Partial One.

CHICAGO HOUSE WRECKING CO., - - West 35th and Iron Sts., CHICAGO.

Help Wanted.

Undisplayed Advertisements for Help Wanted not exceeding fifty words, including address, One Dollar each insertion. Additional words two cents each.

Original letters of reference should not be inclosed with replies to advertisements appearing in these columns, as they are frequently mislaid and lost. A copy of the reference will serve the purpose.

An energetic man to take position in sales department of large manufacturing company, having headquarters in Pittsburgh; preferably a college man, with knowledge of chemistry and metallurgy, and some practical experience in the iron and steel business; in answering state age and salary expected. Address "C. B. J.," care *The Iron Age*, 509 Hamilton Building, Pittsburgh, Pa.

MANUFACTURERS' AGENTS or TRAVELING SALESMAN to handle our goods; must give good references; write for particulars. Lloyd Mfg. Company, Minneapolis, Minn.

FOUNDRY FOREMAN for a foundry in New England doing general work, such as cotton mill machinery, pulleys, hangers, &c.; state age, experience, salary expected, &c. "Foundry," care *The Iron Age*, 70 Kilby street, Boston, Mass.

Two or three DRAFTSMEN familiar with iron work and tube mill machinery; state experience and salary expected. Address "Tubes," care *The Iron Age*, New York.

A SALESMAN competent to sell general hardware at retail and thoroughly posted on builders' hardware. Address with references, "W. M.," care *The Iron Age*, 70 Kilby street, Boston, Mass.

A MECHANICAL ENGINEER, able to command trade in heavy machinery, to conduct affairs of an established foundry and machine company; a liberal salary and an opportunity to acquire some stock of the company will be allowed to the right man. Address, with particulars, "Confidential," care *The Iron Age*, 509 Hamilton Building, Pittsburgh, Pa.

A thorough, competent ROLLING MILL SUPERINTENDENT to erect and take charge of rolling mill to manufacture sheet and tin plate; one who can give cost of manufacture in detail from billet to tin plate; state salary expected, experience and references. Address "A. R. Works," room 606, 225 Dearborn street, Chicago, Ill.

An experienced DRAFTSMAN in conveyor and elevator engineering; also several first-class STRUCTURAL STEEL DRAFTSMEN; state age and terms. Address Heyl & Patterson, Pittsburgh, Pa.

FOREIGN REPRESENTATIVE wanted—agent who can sell Babbit metal in Cuba. Address Markle Lead Works, 720 Rialto Building, St. Louis, U. S. A.

BRICK MASON wanted by an Eastern rolling mill; a thoroughly competent man to build and keep in repair, puddling, bushelling and heating furnaces. Write, giving experience and wages expected, to "Rolling Mill," care *The Iron Age*, New York.

POCKET CUTLERY SALESMAN to solicit orders from the retail trade in Iowa and Nebraska for a prominent American manufacturer. Address, stating experience, &c., "P. C., No. 89," care *The Iron Age*, New York.

GENERAL FOREMAN for erecting shop near Chicago; good salary to capable man; both heavy and light work. Address "A. B. C.," care *The Iron Age*, Fisher Building, Chicago, Ill.

A first-class MECHANICAL DRAFTSMAN; one experienced in steel mill work preferred; good wages and permanent position for the right man. Address "C. M., 726," care *The Iron Age*, New York.

As ASSISTANT FOREMAN in new machine shop in the West, doing general and mill work, a first-class machine hand; one who can handle men and see that machines are worked to full capacity; also must understand latest methods and special tools. Address "F. F., No. 726," care *The Iron Age*, New York.

Situations Wanted

Undisplayed Advertisements for Situations Wanted not exceeding twenty-five words, including address, Fifty cents each insertion. Additional words two cents each.

DROP FORGE DIE MAKER, agricultural, carriage or bicycle work; could handle men; open for engagement. Address "Square," care *The Iron Age*, New York.

By a competent FOUNDRY FOREMAN, light or heavy work. Address "Position," care *The Iron Age*, New York.

A live, up to date railroad, steamboat, mill supply and hardware man is open for an engagement; qualified to take full charge of store, make estimates, &c.; practical mechanic, pipe fitter, &c.; sober and reliable; reference. Address "H. Supply," care *The Iron Age*, New York.

CANADIAN REPRESENTATION.—Young man (27), four years' experience, calling on all Canadian hardware jobbers, desires to represent a few good manufacturers; correspondence invited. Address "Canadian," care *The Iron Age*, New York.

By iron and steel works CHEMIST; eight years' experience in all kinds of iron and steel work. Address "All Kinds," care *The Iron Age*, New York.

Brass or bronze founders desiring first-class BRASS MOLDER and MIXER address for correspondence "Mixer," care *The Iron Age*, New York.

FOREMANSHIP OF IRON FOUNDRY by experienced foreman in engine and general jobbing, New England or East. Address "Jobbing," care *The Iron Age*, New York.

By young man with several years' experience as TIMEKEEPER and cost clerk; can furnish A1 references. Address "Timekeeper," care *The Iron Age*, New York.

An industrious ROLL TURNER is open for a situation; a capable and sober man. Address "Industrious," care *The Iron Age*, Hamilton Building, Pittsburgh, Pa.

MECHANICAL ENGINEER; 12 years' experience as draftsman, chief draftsman and as superintendent of construction on electrical, hydraulic and blast furnace machinery and power plants; first-class references. Address "Hydraulic," care *The Iron Age*, New York.

O. H. MANAGER; 16 years' practical experience; undeniable references. Address "Wellman Furnace," care *The Iron Age*, New York.

First-class MECHANICAL ENGINEER and DESIGNER thoroughly familiar with modern iron and steel works, rolling mills, furnaces, water, steam and power plants, auxiliary machinery, long experience in shops, mills and office, good observer and pusher, inventive and executive abilities, desires position. Address "Progressive," care *The Iron Age*, New York.

By SALESMAN, for years in stoves and house furnishing goods line, eight years with present employer; can estimate from plans and specifications for builders' hardware. Address "D. F. F.," care *The Iron Age*, Fifth and Main streets, Cincinnati, Ohio.

Young man with shop and general manufacturing experience desires work. Box 1429, Boston, Mass.

CHIEF CLERK and ASSISTANT to SUPERINTENDENT of large blast furnace plants, is now open for a position of trust; 29 years old, sober, energetic and accustomed to hustle; let us talk it over. Address "Energetic," care *The Iron Age*, 117-119 South Fourth street, Philadelphia, Pa.

Experienced steel man of good business address and tact; Lehigh graduate, with exceptional connections in London to represent American steel and allied trades in Great Britain. Address "London," care *The Iron Age*, New York.

By a young man, college graduate; eight years in large foundry and machine shop, as ASSISTANT SUPERINTENDENT, SALES CLERK and PURCHASER; good draftsman and cost keeper; moderate salary. Address "M. M.," care *The Iron Age*, New York.

MECHANICAL ENGINEER, 15 years' experience in manufacture of hardware and small machinery, will be open for engagement after September 15; best references. Address "W. S. C.," care *The Iron Age*, New York.

HARDWARE.—A responsible position as MANAGER, ASSISTANT BUYER or SALESMAN desired in or near New York City by a young man (32), single (13 years' experience), who now holds position with prominent wholesale and retail house near Pittsburgh; thoroughly posted in light and heavy hardware in all details; best of references; can be interviewed in New York last week in August. Address "E.," room 213, 415 Broadway, New York.

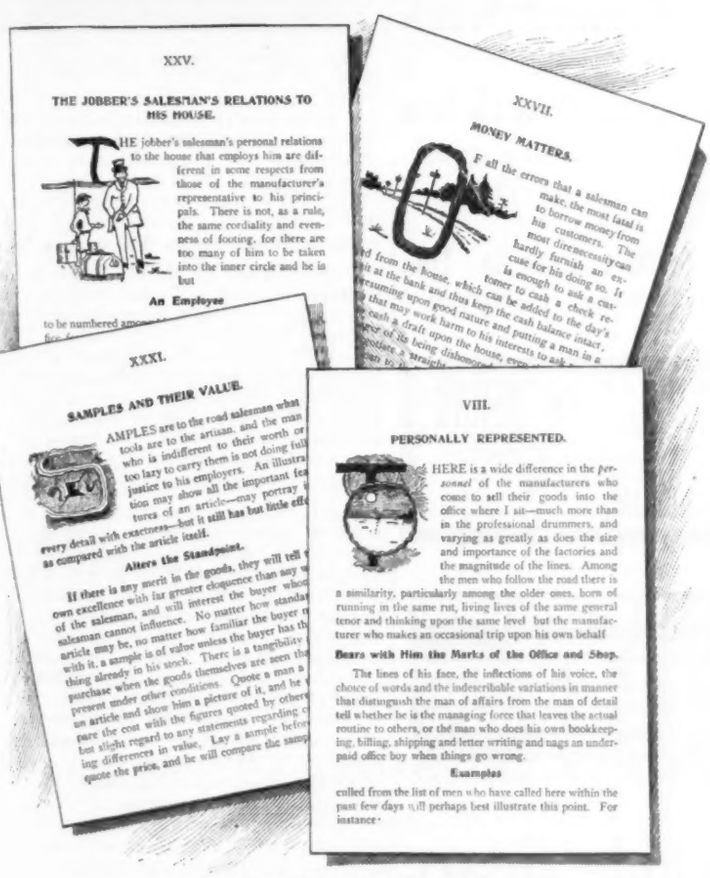
HARDWARE SALESMAN, with ability, 38 years of age, unmarried, having traveled for one firm ten years, desires position. Address "Steven," care *The Iron Age*, New York.

By young man with experience as SUPERINTENDENT of FOUNDRY and MACHINE SHOP; general work; practical hustler; can produce results. Address Box 34, Bristol Hotel, Cincinnati, Ohio.

THE KNIGHT OF THE GRIP

A SERIES OF DISSERTATIONS ON HIS CONDITION, CHARACTER AND CONDUCT AS THEY APPEAR TO AN ORDINARY CHAP WHO HAS STUDIED HIM.

THIS interesting series of papers relating to the personality, methods and experience of traveling salesmen is replete with suggestions and information for both merchants and salesmen, and is written by one who is thoroughly familiar with the Hardware business and many of its representatives on the road.



XXV.

THE JOBBER'S SALESMAN'S RELATIONS TO HIS HOUSE.

THE jobber's salesman's personal relations to the house that employs him are different in some respects from those of the manufacturer's representative to his principals. There is not, as a rule, the same cordiality and evenness of footing, for there are too many of him to be taken into the inner circle and he is but

An Employee

XXVII.

MONEY MATTERS.

F all the errors that a salesman can make, the most fatal is to borrow money from his customers. The most dire necessity can hardly furnish an excuse for his doing so. It is enough to ask a customer to cash a check re-

XXXI.

SAMPLES AND THEIR VALUE.

SAMPLES are to the road salesman what tools are to the artisan, and the man who is indifferent to their worth or too lazy to carry them is not doing full justice to his employers. An illustration may show all the important features of an article—may portray every detail with exactness—but it still has but little effect as compared with the article itself.

Always the Standpoint.

If there is any merit in the goods, they will tell their own excellence with far greater eloquence than any salesman, and will interest the buyer where no matter how standard the article may be, no matter how familiar the buyer is with it, a sample is of value unless the buyer has the thing already in his stock. There is a tangibility to purchase when the goods themselves are seen that present under other conditions. Quote a man a price on article and show him a picture of it, and he will pare the cost with the figures quoted by others, but slight regard to any statements regarding quality ing differences in value. Lay a sample before him, quote the price, and he will compare the sample

VIII.

PERSONALLY REPRESENTED.

THERE is a wide difference in the *personnel* of the manufacturers who come to sell their goods into the office where I sit—much more than in the professional drummers, and varying as greatly as does the size and importance of the factories and the magnitude of the lines. Among the men who follow the road there is a similarity, particularly among the older ones, born of running in the same rut, living lives of the same general tenor and thinking upon the same level but the manufacturer who makes an occasional trip upon his own behalf

Bears with Him the Marks of the Office and Shop.

The lines of his face, the inflections of his voice, the choice of words and the indescribable variations in manner that distinguish the man of affairs from the man of detail tell whether he is the managing force that leaves the actual routine to others, or the man who does his own bookkeeping, billing, shipping and letter writing and nags an underpaid office boy when things go wrong.

Examples

culled from the list of men who have called here within the past few days will perhaps best illustrate this point. For instance

REDUCED FAC-SIMILE PAGES.

PRESS OPINIONS:

Interesting and suggestive.—*Cycling Gazette.*

Clear and forcible in its style.—*Printers' Ink.*

Will well repay perusal by both merchants and salesmen.—*Textile World.*

A readable book containing much that is suggestive to those who are looking for the secret of success on the road.—*Hardware Dealers' Magazine.*

Written in easy and entertaining style.—*The Canadian Grocer.*

You will want to begin at the beginning and read it through; it will do you good.—*Boots and Shoes Weekly.*

A well gotten up, well printed and well written volume.—*The American Artisan.*

Very interesting; contains information useful to all traveling men and merchants in any line.—*Boot and Shoe Recorder.*

It will also prove interesting to employers, who may get a new view of the life of the knight of the grip.—*Crockery and Glass Journal.*

There is much that the young traveling salesman may learn from this book concerning methods of work and how to attain success.—*The Engineer.*

It embodies the record of actual experiences of traveling men, descriptions of methods pursued with various types of customers, and cannot fail to give to the employer many suggestions in regard to the success of his representatives on the road.—*Manufacturers' Record.*

A suggestion of the scope of The Knight of The Grip and the many topics treated is offered in the list of chapter headings which follow:

179 Pages. Size 5 x 7½ inches. Cloth Bound.

PRICE, SIXTY CENTS, POSTPAID.

DAVID WILLIAMS COMPANY, Publishers, 232--238 William St., N. Y.

Book Notes

The Cupola Furnace, by Edward Kirk, is designed to meet a wide demand among foundrymen and melters for a work of practical details regarding the construction and management of cupolas and the melting of iron for foundry work. This is the only volume giving an extended treatment to foundry cupolas. It consists of 361 pages, with 78 illustrations. Price.....$3.50

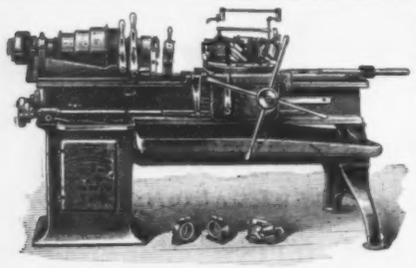
Construction of Small Engines and Boilers.—Amateur mechanics and others having some acquaintance with ordinary machine work will be interested in Egbert P. Watson's "Small Engines and Boilers." Specific directions and dimensioned plans are given for small steam engines and boilers of modern device from 5 horse-power down to model sizes. 108 pages, 8vo, cloth. Price $1.25

Blast Furnace Practice.—Our many readers inquiring for a work on this branch of metallurgy are referred to Thomas Turner's "Metallurgy of Iron." The book is intended for persons connected with the manufacture of iron and steel. Four of the seventeen chapters are devoted to Blast Furnace Construction, the air and fuel used, and Blast Furnace reactions. Other chapters are given to Iron Ores and their Preparation, Properties of Cast Iron, Foundry Practice, the Production of Wrought Iron, the Puddling Process, and finally the Corrosion of Iron and Steel, a subject of importance in connection with modern structural engineering. 367 pages, illustrated, cloth. Price $4.50

Chemists' Pocket Book, by Thomas Bayley, of which the seventh revised and enlarged edition now appears, contains an immense collection of chemical memoranda, formulas and tables comprising over 550 pages. The book is a handy reference for chemists, chemical manufacturers, metallurgists and others. It is divided into 14 sections, as follows: Mathematical; Atomic Weights, &c.; Weights and Measures; Thermometry, Barometry, &c.; Specific Gravity, Hydrometry and Specific Gravity of Solutions; Melting and Boiling Points; Solubility, Eudiometry; Analysis; Mineralogy; Alcohol; Beer; Sugar; Miscellaneous; Photography. It is leather bound, and in convenient form for pocket. Price.....$1.50

All Books prepaid at published prices.

DAVID WILLIAMS COMPANY,
232-238 William St., New York.



The Flat Turret Lathe

Does lathe work accurately up to 2 in. diameter by 24 in. long.

JONES & LAMSON MACHINE CO.

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A. B. C. and Lieber's Codes used.

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Charlottenstrasse 112, Düsseldorf, Germany.

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THE W. S. TYLER COMPANY,

Successors to
THE W. S. TYLER WIRE WORKS CO.,
MANUFACTURERS OF

METAL ELEVATOR CABS,

OF OUR OWN SPECIAL DESIGNS,
In any Finish Desired.

Estimates Given - - On Designs of Architects.

CLEVELAND, OHIO.

The only reasons that higher prices are being constantly paid by the most prominent steam users in the United States for Cahall Boilers are—that they are better made last longer, cost less for maintenance, show a higher efficiency and make drier steam than any other kind.

Send for illustrated catalogue.

Cahall Sales Department, Pittsburg, Pa

"AMERICAN" TRANSMISSION ROPE.

SEE ADVERTISEMENT PAGE 6.

ALUMINUM

Ingots, Sheets, Wire, Rods, Castings.

Aluminum Wire and Cables (bare and insulated) FOR

ELECTRICAL CONDUCTORS.

The Pittsburgh Reduction Co.,
Pittsburgh, Pa.

H. C. FRICK COKE CO.,

Post Office, PITTSBURG, PA.

FRICK COKE

Mines and Ovens in the Connellsville Coke Region, Penna.

HEADQUARTERS FOR

GENUINE

CONNELLSVILLE COKE

For Blast Furnaces and Foundry Cupola Work; also Crushed Connellsville Coke (substitute for Anthracite Coal) for manufacturing and domestic purposes. 13,500 ovens. Daily capacity, 30,000 tons of Coke.

☞ **Direct Connections with all Railroads Entering the Region.** ☜

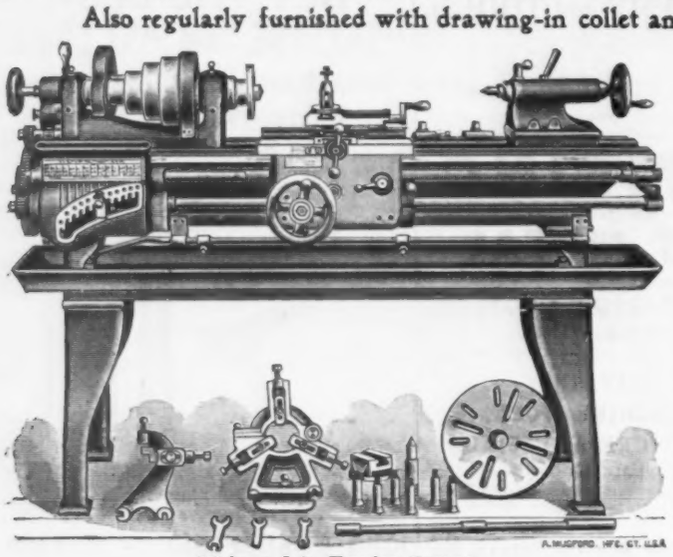
Quotations, Freight Rates, Pamphlets giving full information promptly furnished upon application.

DO you want a lathe for your tool-room or laboratory, one that is adapted to and will produce the finest class of work in great variety? If so, this 12-in. Hendey-Norton will exactly meet your requirements in every particular. ***It has ALL the valuable attachments and improvements for which the Hendey-Norton lathe is noted.***

Also regularly furnished with drawing-in collet and watch tool chucks from ⅛ to ½ by 16ths; special sizes up to ½ in. can be furnished if wanted. These are invaluable for making small taps, reamers, mills, and other small tools from the rod—no previous cutting off and centering required.

This lathe furnished in 4 ft., 5 ft. and 6 ft. beds.

For full catalogue and description send to



12 in. x 5 ft. Hendey-Norton.

THE HENDEY MACHINE CO.,

Torrington, Conn., U. S. A.

OR THE FOLLOWING

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Hill, Clarke & Co., Boston; Manning, Maxwell & Moore and The Garvin Machine Co., New York; J. W. Cregar, Philadelphia; U. Baird Machinery Co., Pittsburg; The E. A. Kinsey Co., Cincinnati; Manning, Maxwell & Moore, Chicago; Pacific Tool & Supply Co., San Francisco.

EUROPEAN AGENTS:

Schuchardt & Schutte, Berlin, Vienna, Brussels, Stockholm, St. Petersburg Chas. Churchill & Co., Ltd., London, Birmingham. Adphe. Janssens, Paris. Stussi & Sweifel, Milan, Italy.

THE IRON AGE

THURSDAY, AUGUST 16, 1900

Coal Dust as Fuel for Steam Boilers.

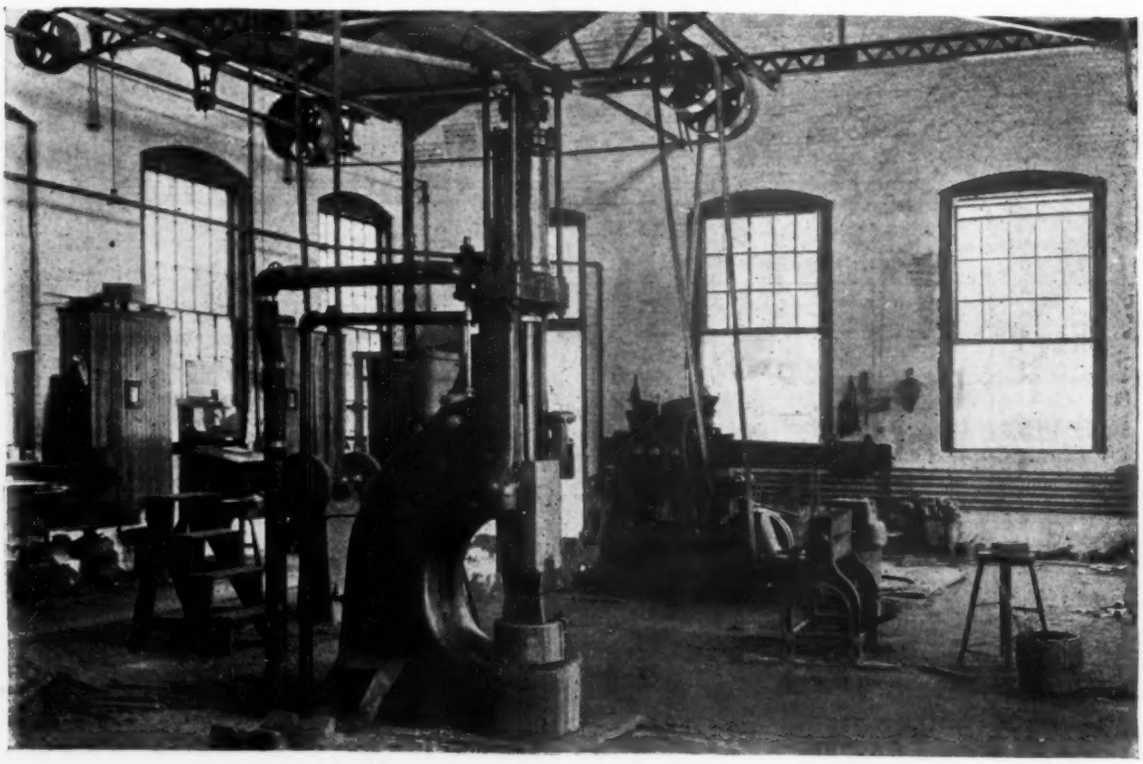
The first experiments made in Switzerland on the use of coal dust as fuel for steam boilers were carried out in 1896 by the wish of Mr. Gressly at the Berne small arms factory, under the superintendence of the Swiss Society of Boiler Owners. The boiler used was of the Sulzer Cornish form, and the Mehl grate and Wegener system of firing were both tried. The results appeared in the 1896 report of the society and showed that the dust could be burned smokelessly with a thermal efficiency of 20.93 per cent., and a saving in cost of steam of 15.5 per cent. Subsequently at the Gerlafingen iron works a Lancashire type of boiler was fitted up for coal dust burning, and since the spring of 1897 Messrs. Sulzer have given the subject great attention. The grinding of the coal to form the dust is the most expensive part of the process. In Basle the Warteck Brewery took up the subject and used the Wegener apparatus, and comparative tests were made with this and the Cario system of firing, and proved favorable to the former.

At the Polytechnic at Zurich the Wegener system was used for a time in an old boiler, but was given up, as it was feared the excessive heat produced would injure the furnaces. The boilers require to be specially adapted for dust burning. For successful results the dust must be in the form of very fine powder, and if the coal be damp it is difficult to grind.

A table is given in the *Schweizerische Bauzeitung* of the results obtained at the cement works at Ehingen as compared with firing in a Ten-Brink furnace, and the costs of the former appear very favorable, as the dust firing enabled a very cheap kind of coal to be used. It appears, however, that the coal dust firing has been subsequently given up, not, however, owing to inherent defects in the system, but because the excessive heat produced by the dust was localized so much that it caused damage to the furnaces of the Ten-Brink boilers, which had not been specially designed for the use of dust, but merely temporarily altered for the purpose.

New Smith Shop of the Bullard Machine Tool Company.

The new smith shop of the Bullard Machine Tool Company, Bridgeport, Conn., of which several views are here presented, may be considered as being a splendid example of the best practice in forge shop design. The building is well lighted by windows in all four of the sides and in the monitor, and ample ventilation is provided by swinging sashes in the monitor roof. The atmosphere is perfectly clear, as the forges are of the Sturtevant down draft type. The building measures 57 x 40 feet 8 inches, and the clear hight from the floor to the lower chords of the roof trusses is 13 feet. The walls are of brick, 16 inches thick, the roof being light steel construction, as shown in Fig. 2.



SMITH SHOP OF THE BULLARD MACHINE TOOL COMPANY.

The equipment consists of three down draft forges, Fig. 7, one furnace for large work, Fig. 6, one Bradley hammer, one Morgan steam hammer, and the necessary small tools. Blast for the forges is provided by a blower operated by an electric motor placed on the roof trusses. The hood of each forge is connected by pipe with the core of the main stack, the draft of which effectually removes all smoke. Steam for the hammer is furnished

by the main boilers, which are in an adjoining building. The steam piping is all underground. Power is supplied by an overhead motor, as shown in Fig. 1.

The Early Anthracite Iron Industry.

Samuel Thomas of Catasauqua, a veteran ironmaster, has contributed to the transactions of the American Institute of Mining Engineers some very interesting reminiscences of the early manufacture of anthracite pig iron, in which his father, David Thomas, was the principal actor. David Thomas, struck by the utility of the hot blast invented by Neilson, introduced it at Yniscedwyn, in Wales, in 1837, in the manufacture of pig iron with anthracite as a fuel, and in 1839 accepted an engagement to build a plant for the Lehigh Crane Iron Company. In his address Samuel Thomas gives a detailed account of the negotiations and then takes up the personal narrative, as follows:

The first week of May, 1839, found our little family group at Swansea, on board of one of the coast steamers on our way to Liverpool, as there were no railroads across the country at that time. The steamer "Great Western" had made but two or three voyages across the Atlantic; so, after much discussion among the parties interested, it as decided that, as steam was still considered a dangerous venture, we should take a sailing vessel; and our passage was engaged on the clipper ship "Roscius," commanded by Captain Collins, cousin of E. K. Collins, of the celebrated line of steamers of that name. The "Roscius" and the "Great Western" left port on the same day; the steamer arriving in New York but four days in advance of the clipper, which had an unprecedented voyage of 23 days. Our first month on American soil was spent in New Brighton, Staten Island, where my father lay very ill of a fever, and was faithfully attended by Dr. Harcourt, the genial quarantine physician. On his recovery, he took me with him to Philadelphia, where he had been called to attend a meeting of the Crane Company's board relative to his entering upon his duties. We returned to New Brighton July 4, and two days later turned our faces toward the Lehigh Valley, our future home, taking the New Jersey railroad via Jersey City and New Brunswick—at that time the terminus of the road, which, it may be of interest to note, was laid with strap rails.

Building the Furnace.

From New Brunswick the journey was continued by stage, the first night being spent at Easton, and Allentown being reached July 9. Here we resided four months while our home was being built near the new works. On July 11 my father and I started on foot for the site of the future works, near what was then known as Biery's Bridge, where we spent several hours, making measurements from which to work out plans for the construction of the plant—I, then a boy of 13, carrying one end of the tape line. About August 1, surveys and plans being completed, work was commenced on excavations for the foundations of the wheel pit, and on a branch canal 25 feet wide, which was to be the feeder or race way to the water wheels, and also the route for boats to bring material to the works. The excavation was under the charge of Robert McIntyre and William Paul. A little later the hot blasts and furnace foundations were commenced; the furnace being some 30 feet square at the base, 12 feet bosh and 45 feet high. Its lines are shown in Fig. 2. All the masonry was laid by Isaac McHose, Sr., of Rittersville, whose son Samuel was subsequently the builder of nearly all the furnaces in the Lehigh Valley. The hot blasts, with the usual bed pipes, consisted of four ovens of 12 arched pipes each, 5 inches interior diameter, 1½ inches thick in the legs and 2 inches thick in the arch. They were built on the ground and fired with coal, having deep closed ash pits, into which blast was introduced for active combustion in lieu of a draft stack. The arch pipes were not connected with the nozzles on the bed pipes by a socket and rust joint as in later years. The joints were made with liquid cast iron, the point of junction on the arch pipes and nozzles on bed pipes being carefully luted to prevent the iron from running into the bed pipes. A pattern in three parts 1 inch thick, corresponding to a socket, was placed against the pipe and nozzle with sand packed around it, and when drawn out left a space into which the iron was poured. On the side of two pieces of the pattern was a hub in which was placed a core of the depth of the socket, for the purpose of driving a steel pin to split it in renewal of pipes. Melting the iron was done in a small movable cupola placed at the end of the ovens and blown by hand with a very large blacksmith bellows; and the melted iron was carried in small hand ladles to pour the joints. After the joints were made, they were deluged with salt and sal ammoniac water, which rusted them perfectly tight.

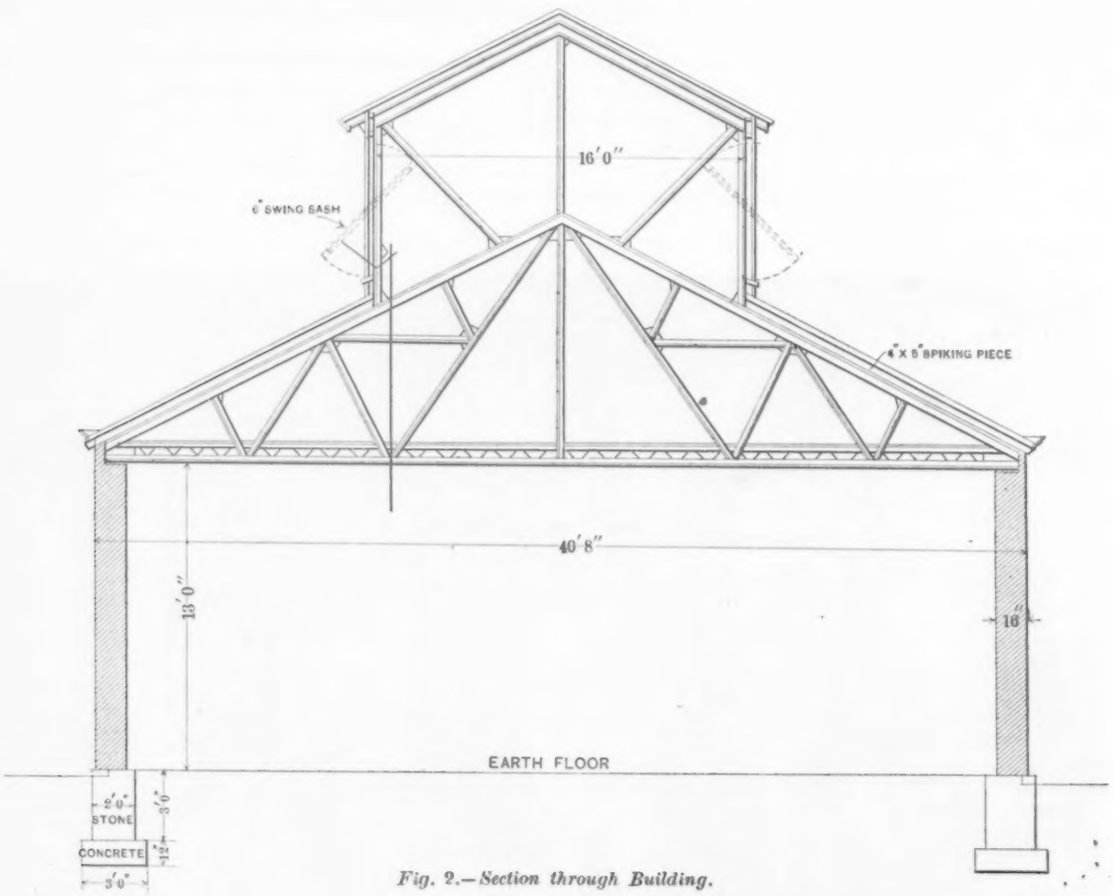


Fig. 2.—Section through Building.

SMITH SHOP OF THE BULLARD MACHINE TOOL COMPANY.

This plan was followed for several years. There were diaphragms in the bed pipes, diverting the blast through three pipes from side to side; and, with good firing, a temperature of 600 degrees was easily obtained; but, generally speaking, that was not maintained. The elevator for filling the furnace, called a "water balance," consisted of two square boxes of sufficient size, one on each end of a chain, passing over a large wheel with a brake; a sufficient amount of water being admitted into the boxes on top to bring up a load on the other side, while the water escaped out of the boxes automatically at the bottom.

The Blowing Engine.

No. 1 furnace was blown by a breast wheel 12 feet in diameter and 24 feet long; the fall of 8 feet between the canal levels at lock 36 furnishing the power. On each end of the wheel were segments on its circumference, of 10-inch face, geared into pinions on double cranks, these driving two blowing cylinders having 5 feet diameter and 6-foot stroke, with parallel motion, and worked by beams on gallows frames. The beams were constructed of two pieces each of white oak timber, 14 x 16 inches in the center, and tapering toward the ends; the beams being also trussed with 1½-inch rods. The center shaft of cast iron, with extension plate and flanged, was fitted between the timbers; and at the end heavy cast iron spade handles were also fitted between the timbers, for coupling the connecting rods and links, all firmly bolted together. The blast from the cylinders was conducted underneath the canal through an 18-inch cast iron pipe. This being the only receiver the strokes of the cylinders could be counted at the furnace tuyere as easily as in the wheel house. (The wheelwrights who did the work were "Squire" George Frederick, with his sons, Thomas and Nathan, Edward Scherer, Thomas Barber, and John Leibert, father of Owen and Henry, now at the Bethlehem Steel Works.) About midsummer of 1839 such portions of the outfit for this furnace as had been constructed on the other side of the Atlantic were shipped (some castings being made here later on), except the two blowing cylinders, which the hatches of the ship were too small to admit. The vessel was also laden with rails for the Lehigh Coal & Navigation Company, and cleared for Philadelphia, but, having sprung a leak, she put into Norfolk, Va., in distress, after having jettisoned about 300 tons of the rails. On receipt of this news, Mr. Hazard and my father went to Norfolk, and, to their consternation, found the cylinders were not there; the captain telling them, in language more forcible than elegant, that if the castings in the hold had not been so heavy they would have gone overboard also. After necessary repairs, the vessel proceeded to Philadelphia; and thence all the material for the furnace was shipped by canal to the works. Steps were taken at once to procure cylinders. Application was made to Alger at Boston, the Allaire Works, and the Morgan Iron Works of New York, but they all declined to undertake the work, as they could not bore cylinders of that size, and would not enlarge their mills for the purpose.

At this time there was not a boring mill in the United States large enough to bore a cylinder of 60 inches diameter; but American progress in the construction of machinery was so rapid that in 1851 the I. P. Morris Company of Philadelphia, Pa., made four cylinders for Ericsson's hot air ship, of 168 inches diameter and 6 feet stroke.

Application was then made to Merrick & Towne of the Southwark Foundry, Philadelphia, who agreed to undertake the work, enlarging their boring mill for the purpose, and succeeded in making two very fair cylinders, for which 12½ cents per pound was paid. These cylinders were bored by Harry Smith, who fitted them to the tops and bottoms sent from England, and subsequently erected them in place. The original cylinders, which had been so unceremoniously left on the docks at Cardiff, finally arrived at their destination in 1840. They were unloaded at lock 36, and one of them figured in the great flood of 1841, being rolled by the water a quarter of a mile down to Biery's bridge, where it lodged in a deep gully. Later, these cylinders were used in the construction of two blowing engines, which were erected back of No. 1 furnace. They were in use there several years, and were then taken down to make room for the present railroad back of the furnace. About 1866 the Lockridge Iron Company were organized at Alburtis. I purchased these engines and erected them at the first furnace built there. The Lockridge Company were later merged into the Thomas Iron Company, and these historical cylinders are in use by the latter company today.

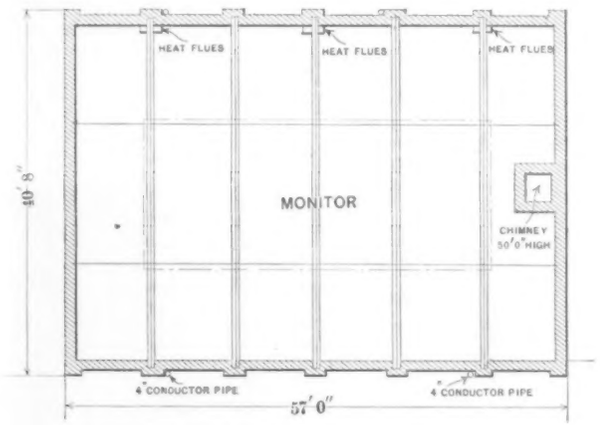


Fig. 3.—Plan.

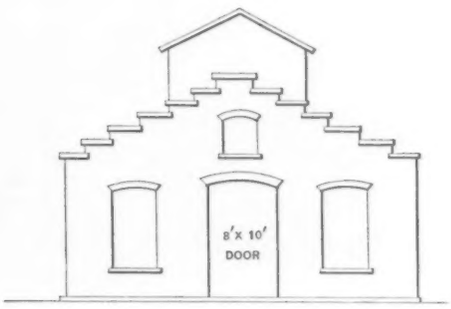


Fig. 4.—End Elevation.

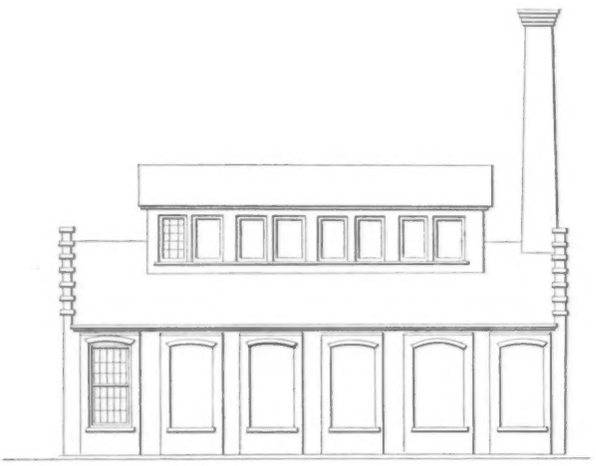


Fig. 5.—Side Elevation.

SMITH SHOP OF THE BULLARD MACHINE TOOL COMPANY.

After this long digression, I return to the history of the construction of the works. That all beginnings are hard was never better illustrated than in this instance. Delays, difficulties and discouragements sprang up on every side, not least among which was the second serious illness of my father, keeping him housed during weeks in the autumn, and greatly impeding the progress of the work, which he directed as best he could, using me as messenger to those in charge. The want of foundry facilities was one of the greatest difficulties encountered; but finally the large cast iron center pieces, segments, gudgeons and pinions for the water wheel were made at the Allentown Foundry, owned by George Brobst and Stephen Barber. It was at their foundry that the first steam engine in Lehigh County was erected. It is preserved as a curiosity on the campus of Lafayette College, at Easton, Pa.

After many vexatious delays, the furnace was completed and successfully blown in at 5 o'clock p.m., July 3, 1840, and the first cast of about 4 tons of iron was made on the memorable Fourth of July of that year, the keepers in charge of the furnace being William Phillips and Evan Jones.

Blowing In.

Looking back on those primitive times, I recall things which done to-day would seem ridiculous. For example, to prepare a furnace for blowing in a process called "scaffolding" the furnace was performed. The front or neck of the hearth was open, without the dam plates. Across the knees of the buckstaves was thrown a bar of iron; and, over this and under the tymp, long heavy bars called "ringers" were driven several feet into the material in front, these bars holding it up, while below all the clinkers and ashes that could be reached were shoveled and scraped out of the furnace; the dam plate and "harp" were then put in place, and the bars were drawn out, allowing the front to fill up with fresh live coal. The plate called the "harp" was a long tapered plate with teeth like that of a saw, fastened against the dam plate, and used to hold up the cinder fall. The distance between the dam plate and the tymp was about 24 inches. The blast pressure being so light, it was not necessary to hold the plate down with props under the mantel, as in later years.

During the construction of the works mines necessarily had to be opened for the supply of iron ore. The first of these was Race's mine, near Schoenersville, Hanover township. The first load of ore brought to the works was hauled from that mine by Henry Hoch. In the same neighborhood Goetz's and Daniel's mines were opened, and others in North and South Whitehall townships. The magnetic ore came from the Irondale, Byram and Dickerson mines in New Jersey, small lots being purchased from each place and shipped by the Morris Canal. The proportion of ores generally used was one-fourth magnetic and three-fourths hematite. The furnace remained in blast until its fires were quenched by the rising waters of the great flood of January, 1841, a period of six months, during which 1080 tons of pig iron were produced. The largest output for one week was 52 tons.

Furnace No. 1 was blown in again after the freshet, May 18, 1841, and then remained in blast until August 6, 1842, producing 3316 tons of pig iron. My father had been very generally looked upon as visionary. The remark made by a leading charcoal ironmaster, whom I well knew, "I will eat all the iron you make with anthracite," gave expression to the general sentiment of the trade at the time. It is needless to say that he did not keep his promise, although my father cordially invited him to a hearty dinner, cooked in the company's first furnace.

After the success of this furnace had been fully established anthracite furnaces began to multiply rapidly. Post built at Stanhope, N. J.; Henry at Scranton, Firmstone at Glendon, Governor Porter at Harrisburg, Eckert at Reading, and by 1846 there were about 40 anthracite furnaces in the country, distributed on the Lehigh, Hudson, Schuylkill and Susquehanna rivers.

In the latter part of 1841 the Crane Company determined to build No. 2 furnace, and preparations were made accordingly. The furnace was built in the summer of 1842, and blown in in November of the same year. It was 34 feet at the base, 13 feet 4 inches bosh, and 45 feet high. The hot blast was placed on top, additional space being provided by making the back of the furnace vertical for 25 feet, instead of giving it the usual batter. All the masonry, both brick and stone, was laid by David Walters, who had previously built a furnace at Farrandsville, Pa. (He was a most excellent mechanic, with peculiar ideas of his own; for instance, he prevailed on my father to allow him to put in the lining brick of No. 2 furnace in spiral instead of horizontal lines; and inasmuch as one way was about as good as another, my father gave his consent.)

The blowing apparatus for this furnace had two horizontal cylinders of 5-foot diameter and 6-foot stroke, driven by two Fourneyron turbines of 8 feet outside diameter and 15-inch depth of bucket. On the upper end of the turbine shafts was a 30-inch pinion geared into a heavy horizontal cog wheel of 8 feet diameter and 10-inch face, in which were inserted the crank pins, and to these were coupled the necessary connecting rods and cross heads to drive the cylinders. Each machine was separate and was operated independently. All this machinery was made by Merrick & Towne, Southwark Foundry, Philadelphia. The blast was conducted to No. 2 furnace through the same pipe, under the canal, as to No. 1. The turbines proving great consumers of water, it became necessary to construct another canal as a feeder, the current in the old canal being so great that it was almost impossible to tow a heavily loaded boat against it, so that the water on the water wheels frequently had to be checked to permit boats to pass through. A large force of men under Samuel Glace was put on the construction of the second canal, which was located on the south side of the old canal, and completed in about four months. The canal is therefore double at Catasauqua—a fact which has excited the curiosity of many. To protect it against floods, a cinder bank was deposited on the outside, and upon this the Lehigh & Susquehanna Railroad is now laid, from the guard lock at Hartman dam to Catasauqua station.

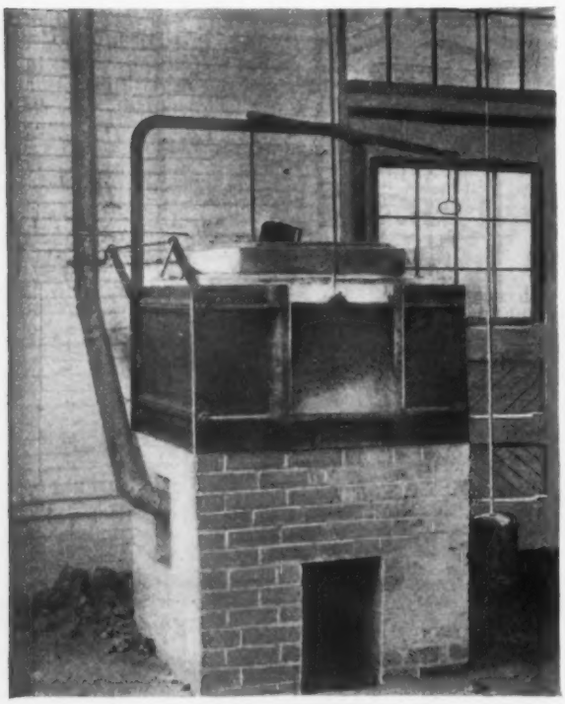


Fig 6.—Furnace.

Fig 7.—Down Draft Forge.

SMITH SHOP OF THE BULLARD MACHINE TOOL COMPANY.

Utilizing Waste Gas for Refining Iron.

In 1843 an experiment was tried at this furnace—the first, I think, of the kind in this country—with the aim of utilizing the waste gases for refining iron, taking

out the gas at a depth of some 9 feet below the top of the furnace. Previously the gases used for steam and hot blasts had been taken out immediately under the dumping ring, at the tunnel head. The practical purpose of the experiment was the refining and puddling of iron for making an extra quality of bar iron and wire. I quote from the furnace charging book the following in my father's handwriting, under date of October 23, 1843:

"On Monday night at 12 o'clock the blast was stopped on the furnace to build up gas flues; there was 11½ inches of the backing of the furnace taken out, which was all calcined into lime." (The masonry of the furnace was limestone.) "The blast was put on again Saturday morning, October 28, at 1 o'clock in the morning."

The construction of this refinery was very similar to that of a puddling furnace. The gas was brought down through a conduit built of brick against the side of the furnace and conducted into one end of the refinery, passing over a bridge wall into the body of the refining furnace, which was built in a circular form, and on one side of which were inserted two tuyeres at an angle, to deliver the blast into the molten iron. Immediately back of the bridge wall there were some 10 or 12 1-inch pipes, contracted at the tips, through which hot blast was blown into the gas as it passed over the bridge wall. So long as the material which went into the furnace was dry the gases came down at a high temperature, and the heat was intense and melted the iron very readily. After a rain, however, the wet material going into the furnace so reduced the temperature of the gases in the flues that it was insufficient to melt the iron. When successful heats were made, the metal was tapped into iron chills about 3 feet wide and 8 or 10 feet long, making a plate 1 or 2 inches thick; and as soon as the iron was set it was deluged with water and broken up for shipment. Owing to the irregularity of the temperature of the gas, however, not more than 50 tons of metal were made in the six weeks of trial, and the experiment was abandoned as unprofitable. It was tried under the supervision of C. E. Detmold, an eminent engineer from Lippe-Detmold, Germany, a most genial man, of broad education and intellectual resources, whose name is associated with various important works and surveys in this country, among others the laying of the foundation of Fort Sumter, of historic memory. (Mr. Detmold was, at this time, the agent of Faber du Faur, inventor of the method of utilizing the waste gases of blast furnaces.) He assigned to superintend this experiment young Edward S. Renwick, of the distinguished family of architects and mechanical engineers of that name, who, with his brother, subsequently built and owned a blast furnace at South Wilkes-Barre, Pa.

Reconstruction of Blowing Apparatus.

In 1844 the blowing appartus was reconstructed. As the blast to both furnaces was blown in common, the turbine wheel proved so much more powerful that we could not get the necessary service from the breast wheel. So the pinion and the double crank were abandoned, and the forebay to the first breast wheel was shortened 8 feet, moving the wheel forward, which brought the center of the wheel directly under the point of the beam. We replaced the original gudgeon with one of 14-inch diameter, on which the crank wheel was placed, connecting it with the original connecting rod. To this was added another wheel, the same as the first, and they were geared together. This gave us a blowing apparatus fully equal to the turbine.

In 1845 it was determined to build No. 3 furnace; and the question at once came up, what power should be used for blowing. I well remember a consultation held on this subject at the Catasauqua office by Messrs. White, Hazard, E. A. Douglas, engineer in chief of the Lehigh Coal & Navigation Company, and my father. Mr. White was a great stickler for water power, and almost insisted upon its being used. Mr. Hazard and my father were in favor of using steam power, maintaining that there was not water enough in the Lehigh during the dry season to blow an additional furnace. The discussion grew quite earnest, and Mr. White somewhat impatiently said to my father, "David, thee does not know what thee is talking about;" but as Hazard and Douglas coincided with my father, steam power carried the day.

No. 3 furnace was 40 feet wide at the base, 17 feet in bosh diameter, and 47 feet high, and was fitted with a water balance, like the other furnaces. It was blown by a pair of beam engines, connected with a single fly wheel; the blowing cylinder was 5½ feet in diameter and 6-foot stroke; the steam cylinders had 26 inches diameter and 6-foot stroke, with slide valve and a cut off. A pressure of about 6 pounds could be maintained, and with that the furnace did fairly well. These engines were built at the Allaire Works, New York, and a Mr. Smith was the engineer in charge of construction.

Passing Electricity Through Molten Iron.

In 1847 an experiment was tried at this furnace by pasing a strong current of electricity through the molten iron, the battery for which consisted of 100 cells, very powerful and dangerous to handle. A heavy iron bar, with a heavy wire attached, was placed in the runner at the end of the casting trough, and a second wire and bar were attached at the extreme lower end of the pig bed, the current being maintained while the iron was flowing and for 20 minutes after the iron was set. This was carried on through some half a dozen casts; but the men became very shy of the wires, because Jimmy Hunter, the keeper, was knocked almost senseless by using an iron bar he held in his hand to remove one of the wires which was in his way. Consequently the experiment was tried in another way. A bar of iron was suspended from the top of the furnace down into the material to a depth of some 10 or 12 feet; to this one wire was attached and the other to one of the tuyere pipes. The current was kept up continuously for two weeks. The samples of iron produced in this experiment were puddled, with the idea that the electric current would be found to have dispelled the phosphorus; but the results showed no apparent difference from the iron otherwise made.

An Early Steam Whistle.

At this time the steam whistle was an unknown sound in the Lehigh Valley. I had secretly had made by Lehman, Sr., a brass founder of Bethlehem, a large whistle, which measured 8 inches in diameter, and about 15 inches in depth of bell; and when No. 3 was ready, and the whistle had been attched to the boilers and they were ready to be tested, and the pressure was up to 60 or 70 pounds, I "let her off." The noise startled the whole town and occasioned much laughter. Mrs. Noah Davis used to tell how she and the women on upper Church street rushed out of their houses to gather up their children, thinking, as they heard the unusual sound, that it was the last trump.

During 1849-50 the Crane Company built furnaces Nos. 4 and 5, 18 feet in bosh diameter and 45 feet high. To drive these furnaces the most powerful blowing engine in the country was erected, with blowing cylinders 7 feet and steam cylinders 34 inches in dameter (high pressure) and 9-foot stroke, which would exert with ease a blast pressure of 8 to 10 pounds per square inch. With the volume of air that could be delivered, the furnaces were too low to do as well as was expected, so they were raised to 55 feet high in 1852, after which the production ranged from 250 to 300 tons each per week.

As my friend of nearly half a century's standing, John Fritz, of Bethlehem, truly says in his reminiscences of the pioneer days of iron making in this country, the active managers of the iron works of to-day, possessed of all the facilities of telegraph, telephone and railroads, know little of the trials and tribulations of those arduous early times. It required three whole days to transact business between us and Philadelphia—two days to go and return by stage, and one to attend to business. When the roads were bad, it often took us 12 hours to reach the city.

The Transportation of Materials.

Up to 1855 our only means of transportation for coal from Mauch Chunk, and magnetic ore from New Jersey, was the canal. The hematite ores and limestone were brought to the works entirely by wagon, the country literally swarming with teams. We paid in some instances as high as $2 per ton for transportation on some of these ores; and not until 1855, when the Lehigh Valley Railroad was opened, and 1857, when the Catasauqua and Fogelsville line was partly finished, did we begin to have a taste of the labor saving facilities so generally enjoyed to-day. An immense amount of labor was required simply to pile up a sufficient amount of coal to run five furnaces during the four winter months. The unloading of the coal was all done by wheelbarrows, and the accumulation of our provision commenced in the spring, as soon as navigation was opened, and continued until the canal was closed, since we had to store not less than 40,000 tons, in addition to what the furnaces were continually consuming. In 1847, with a view of expediting this work, we erected a large amount of trestling 25 feet high and a water balance near No. 3 furnace, so that the coal could be unloaded into cars, elevated, and then dumped in this trestle work. The first season's experience with this system was not encouraging. The rains and snows of winter caused the coal to freeze, and it would come down in great masses, often breaking the legs of the trestles, and crushing the coal, making much waste. After the second season the labor saving apparatus was abandoned and the wheelbarrow was again resorted to.

The facts given I have from my father's own lips. That he did not assert himself more emphatically at the time was due to his modesty and to lack of means and

influence to obtain a patent, which was no small undertaking at that time in Great Britain. Mr. Crane has often received the credit of this useful discovery. With all due respect to his memory, I must state that he was in no sense of the word a mechanic or a technical man, but a shrewd business man, with a faculty for recognizing the merits and promoting the commercial utilization of the inventions of others—a faculty, by the way, which is as essential to industrial progress as the genius of the investigator and inventor.

Josiah White's son-in-law, Richard Richardson, in his history of the early development of the Lehigh Coal & Mine Company (afterward changed to the Lehigh Coal & Navigation Company), refers to the building of the first furnace by my father for the Lehigh Crane Iron Company. He gives the history of Mr. Hazard's trip to Wales to inquire into the results at Yniscedwyn, and says:

"Mr. Hazard ordered such machinery as was necessary to be made for the company, under the direction of George Crane, the inventor, and engaged David Thomas, who was familiar with the process, to take charge of the erection of the works for the manufacture of iron, and to his faithful and intelligent management much of the success of the enterprise was due."

It is not reasonable to suppose that Mr. Hazard, an entire stranger to the business, should have taken the responsibility of procuring the necessary machinery and other appliances for the erection of this furnace. The real facts are that the whole matter was placed in my father's hands, and that, during the four months he remained in Wales after the signing of the contract with Mr. Hazard, he made all arrangements for the entire outfit of the furnace. The blowing machinery was constructed at the Soho Works, England, and the hot blasts at Yniscedwyn from the same patterns as used there, under the supervision of John Clee, the assistant superintendent, who succeeded my father in the management of the works, while the fire brick came from the Stourbridge works, England.

Mr. Swank, the author of that invaluable work, "Iron in All Ages," commenting upon Mr. Richardson's version, says: "We do not hesitate to say that to Mr. Thomas' management was due the whole of the success of the anthracite furnaces built by the Lehigh Crane works." William Firmstone, another eminent authority, says: "With the erection of this furnace commenced the era of higher and larger furnaces and better blast machinery, with the consequent improvement in the yield and quality of iron produced." It has never been claimed that no anthracite pig iron had been made in this country previous to 1840, but only that the commercial success of this manufacture dated from my father's work at Yniscedwyn in 1837, and at the Crane works, Catasauqua, Pa., in 1840. I have the highest authority for the statement that not so much as 500 tons of anthracite pig iron were made in this country during the entire experimental period preceding 1840.

International Union of Metal Workers.

The formation of the International Union of United Metal Workers was completed August 6 at Indianapolis, Ind. Chicago has been chosen as the headquraters for the organization, and the following officers were elected for the first year: President, Charles McCarthy, Cincinnati; first vice-president, Otto Nowack, Chicago; second vice-president, Frederick Marker, Detroit; third vice-president, Charles Smolar, Chicago; secretary-treasurer, C. O. Sherman, Chicago. These officers will constitute the Executive Board for the first year. It was decided that the trades embraced in the order shall be architectural, wire and metal workers, bridge and jail builders, surgical instrument makers, metal pattern makers and coppersmiths.

Hugh W. Adams & Co.—Schedules of Hugh W. Adams, doing business as Hugh W. Adams & Co., commission pig iron merchants, at 15 Beekman street, New York, have been filed by William G. McAdoo, the assignee. They show total liabilities of $385,534, of which there are direct $154,498, and contingent $231,036; nominal assets, $280,838, and actual assets, $70,762. The contingent liabilities are indorsements of notes of various persons, among them being the Randolph Iron Company of Brooklyn, James R. Floyd's Sons, and O. E. A. Wiessner. Among the assets are accounts receivable, nominal $151,112, actual $45,015; bills receivable, nominal $17,710; actual $5164; stocks of various corporations, nominal $80,000, actual none; cash in bank, nominal $8789, actual $7471; equity in real estate, $8000. There is due him from the Randolph Iron Company $56,972, the actual value of which is put in, at 25 cents on the dollar, at $14,243. James R. Floyd's Sons owe him $42,325, which, put in at 50 cents on the dollar, amounts to $21,262. The largest creditors are the Phœnix Bank, $43,000, partly secured; Caroline B. Adams, $32,402; Reading Iron Company, $43,237; Matthew Addy & Co., Cincinnati, $12,755, and W. H. Ainey, Alientown, Pa., $6840.

Building a Ship.

A souvenir issued by the Bath Iron Works of Bath, Maine, contains a general description of the steps taken in building a ship, from which we quote:

When the contract for the construction of a vessel is signed, and as soon as the dimensions and the general arrangement plans and specifications are approved by the owners, work commences immediately in the drafting rooms. The lines and shape of the hull to fulfill the requirements regarding speed, dead weight capacity, &c., are first determined upon. These lines are then faired up on a large scale, and the offsets furnished to the mold loft, where the work of laying down the vessel full size is commenced immediately. In the meantime a wood model on ¼, ⅜ or ½ inch scale, according to the size of the vessel, has been made by the pattern maker from the original office lines, and on this model is lined off all the plate edges, butt, laps, &c., of the shell plating. If the vessel has a double bottom following the outer bottom and sides, such as is usually fitted on war vessels, a model of the inner bottom is similarly made and lined. The keel, bulkheads, decks, foundations, bow and stern framings, deck house, casings and similar plans are roughly outlined. The floor heads, keelsons and stringers are marked on a frame body plan taken from the large scale line drawings, and within a few days of the signing of a contract all the steel plates and shapes are ordered. The stem, stern post, rudder and other large forgings or castings, rivets, deck plank and wood for all other carpenter and joiner work is then ordered, and the drawings are gradually finished, traced and approved, and sent into the yard and shops ready for work when the material arrives. If the vessel is a steamship, the engineering department is notified as soon as the contract is signed what power is required for the vessel, the general type of machinery and the space available for the same, and they at once proceed to determine the size of engines and boilers, and prepare general arrangement plans. The boiler steel is soon ordered, the engine forgings follow, and in a few weeks the patterns for the cylinders, bed plates, &c., will be seen in the foundry.

The keel blocks on one of the sets of ships' ways are located to suit the keel of the vessel to be built, and when the hull steel arrives all is ready to hurry the work along. The frames and reverse frames are bent on the slab as per wooden molds furnished by the loft; the floor plates are laid out from the same frame molds, and the vertical keel, bulkheads, longitudinals and intercostals, if the vessel has any, are all laid off from molds, punched and sheared ready to be fitted in place on the ship. Each frame, with its floor and reverse frames, are riveted by pneumatic tools before being erected, and all the riveting, &c., possible is done before the members are placed in position on the ways. The keel plates, bulkheads, deck beams, &c., are all laid off, shaped and punched in the shop, so that when the keel is laid on the blocks the framing of the ship is soon erected and faired in position. If the stern forgings or castings arrive at the works in time the vessel is framed from aft forward, if not the midship frames are erected first and the vessel is framed from amidships to the ends. As soon as the framing of the ship is faired and rigidly connected the shell and decks are plated, deck house erected and the different connections are riveted, and when necessary calked for water tightness. When the shell is completed, the stern tube, if the vessel is a steamer, is bored out and the tail shaft, propeller, outboard valves, &c., are fitted in position and the vessel is ready to launch. The staging is now removed and the standing and sliding ways with packing are placed in position. On the morning of the day of the launch the standing ways are well greased, and when all is ready the wedges at a signal are driven in, and the ship is raised sufficiently to release the stress upon the blocks. These are then split from end to end of the vessel, allowing the whole weight to rest upon the sliding or launching ways which, in turn, lie upon the permanent or ground ways. After the blocks are split and the ship lies on the launching cradle, which, by the way, is lashed together under the keel by strong rope toggles from side to side at intervals toward the bow, where the model is leaner and the dividing strain is greater upon the cradle, the shore braces are knocked down one by one, thus removing from about the hull the last semblance of ground support.

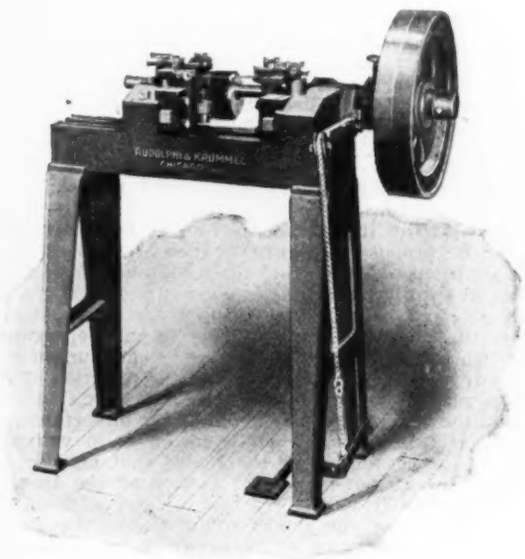
At this stage the ship would break away and slide into the water, were she not held to her place by an arrangement of iron rods, pins and rope lashings. This arrangement secures the sliding to the permanent ways, and until it is removed there is no possibility of the ship starting away. When all is ready and nothing is found to re-

main to prevent the launch itself, the final act is performed by the cutting of the rope lashings, and drawing out of pins before mentioned, and which secured the two sets of ways together. The instant the axes sever the rope lashings there is heard a sharp cracking and rending sound, and the huge mass is seen in motion, rapidly augmenting in speed for its final plunge. A steep auxiliary set of ways under the fore foot are often fitted to assist the vessel in starting, but hydraulic jacks, bumpers, &c., are seldom found necessary. This concern build all their vessels so as to launch stern first. The ways are located approximately square to the river line, and as the Kennebec River is about a mile wide opposite the works, some of the prettiest launchings in the world have been seen at Bath. The vessels are allowed to run out well into the stream and a towboat brings them back to the company's wharf. The time consumed between the signal for wedging and the actual start varies from seven to eight minutes for small craft to 15 or 18 minutes for the larger sea going ships. Soon after the launch the vessel is moved to wharf No. 1 and the large derrick places the boiler and engine on board. Carpenters complete the wood decks and similar work, and soon the vessel becomes a busy working center for shipwrights, carpenters, joiners, pipers, plumbers, machinists, boiler makers, calkers, riggers, painters, &c. At last the work is almost completed, steam is put on the boiler, the engine is turned over, and the vessel is loaded and trimmed for her speed test. The company have had a statute and a nautical mile deep water course surveyed off the Southport shore at the entrance to Boothbay harbor. This course has been measured and approved by the United States Government and several war vessels have steamed over this base on their official trial. The Southport mile is about 13½ miles distant from Bath, but the steam vessels usually proceed to the course by way of Popham, this distance being 19 statute miles. After the vessel has successfully passed through the progressive measured mile trial, or sea trial and turning trials, she returns to the yard, where she receives the few necessary finishing touches and is made ready for delivery to her owners. If the vessel is a barge or sailing vessel no trial trip is necessary; and when the contract for the construction of a steamer requires neither a guarantee of speed nor of power the machinery is quite often tested by a few hours' run at sea.

The power station of the Niagara Falls Hydraulic Power & Mfg. Company is situated at the water's edge in the Niagara gorge. All material and machinery used therein is lowered over the high bank by means of derricks. The very nature of the plant in the power house requires that some very heavy parts of machinery be so lowered, and on August 9, while a 16-ton armature was being let over the cliff by a steel derrick, the derrick gave way, and the armature was allowed to fall many feet. It plunged through the roof of the Cliff Paper Company's incline railway building and lodged between the tracks. The leg of the derrick fell across the roof of the Cliff mill, which is at the water's edge adjoining the power station, and the steel beams were crushed in. The steel derrick had recently been erected and was thought of ample capacity to do the work required of it. The armature was wrecked, and a new one has been ordered from the General Electric Company. The total loss will be between $20,000 and $30,000.

The Rudolphi & Krummel Bail Hook Machines.

The necessity of reducing cost in various lines of manufacture has created a demand for special machines not thought of a few years ago, and operations that were formerly considered comparatively simple now call for special and automatic machines. The machines shown herewith are a good illustration of this fact, being intended for forming the hooks on bails for lard pails, paint buckets and similar articles, an operation which has been done heretofore largely by hand. After the wire has been cut off the right length and formed to the proper diameter (which may be done either by hand or in an automatic machine built especially for the purpose), the ears are put on and then the bails are ready to go to the hook bending machine. The power machine is operated by an automatic clutch, the same as on a power press. The right hand head is stationary, and the left hand head adjustable for bails of different diameters. The foot machine being only single ended, two operations are required for completing the bail, while the power machine will form the hooks on both ends simultaneously. Either machine can be fitted up for different sizes of wire (one die generally allowing a variation of about two gauges), and the hooks will be formed absolutely uniform and in such a way that the ears cannot possibly come off previous to being soldered onto the pails. The operation of the machines is comparatively simple. However, the conditions are modified on the power machine from those prevailing on the foot machine. In the latter the hook is bent by inserting the wire into a slot in the forming die, which, by means of a treadle motion and action of the bevel gears, swings through a sufficient arc of a circle to give the hook the desired shape. The forming parts on the power machine consist of a pin attached to a reciprocating vertical shaft, swinging again through a proportional arc of a circle. The wire in this case, however, has to be clamped previous to the bending operation to obtain hooks of exactly uniform shape, the die remaining stationary during the operation. Where bails are required in large quantities the power machine is the more desirable, not only on account of it having a much greater capacity, but also owing to the fact that as less exertion and skill are required on the part of the operator lower priced help can be employed for operating the same. Either machine will work wire up to No. 9 B. W. G. These machines are made by Rudolphi & Krummel, 96 North Clinton street, Chicago, Ill.



Power Machine.

Foot Machine

THE RUDOLPHI & KRUMMEL BAIL HOOK MACHINES.

The American Sheet Steel Company have ordered the Corrugated Iron plant attached to their Midland Steel Works, at Muncie, Ind., to be closed and dismantled. It is likely that the machinery will be removed to one of the other plants of the company.

Australian Notes.

MELBOURNE, June 22.

Victorian Pig Iron.—The cost of pig iron, imported, delivered at Melbourne foundries, at present is about £6 per ton and upward, according to brand. A company will shortly be floated to work the ore deposit at Lal Lal, Victoria. Experiments were conducted yesterday at the Latrobe street foundry of Hooper & Sons with samples of the ore from the district, some four or five hundredweight being put through the cupola furnace and then run into castings.

The ore was taken from the surface, and was not specially picked out, and the castings were clean, though a trifle hard, a difficulty which can easily be surmounted when the ore is graded. The Government expert reported on a cast iron bar tested as follows: 24-inch span, 2 x 1 inches thick, breaking load 2449, ultimate deflection 0.35 inch, showed a clean fracture—a result considered excellent by Professor Kernot, the expert in question. The syndicate have secured a right to 600 acres of the ore deposits, and expert opinion estimates that there is enough ore in sight to produce an output of 200 tons per week for 70 years. The first cost of production will be from £2 12s. 6d. to £3 5s. per ton, and this will allow a good margin of profit as against the price of the imported article mentioned above. An attempt will doubtless be made to secure Government aid, either a bonus or a subsidy, should assistance be necessary to place this new industry on a sound working basis.

The works of the company will be at Gulong, some 40 miles from Melbourne, and a plant to cost from £16,000 to £20,000 will shortly be purchased. Two blast furnaces will be erected, with a capacity, one of 150 and the other of 50 tons per week. The Government railways will be approached with a view to carrying the ore at reduced rates, as is done in the case of coal, in order to foster the new industry.

The project is most favorably viewed in iron circles here, and with the early federation of these colonies into one commonwealth a large market will be provided for the company to exploit.

New South Wales.—The Department of Works is preparing designs for a floating crane (to be constructed locally) for the port of Sydney. It is to be capable of lifting 80 tons at a speed of 5 feet per minute, and 20 tons at a speed of 14 feet per minute. The estimated cost is £10,000, and expert opinion is that it cannot be done at the price.

Queensland.—The business of the colony is rapidly increasing, and Brisbane, the capital, is pushing on the extension of her wharfage accommodation with all speed. At Cairns, in the northern district, it is stated that an engineering firm, backed with much capital, are about to start a large foundry and a slip for vessels. The machinery, of the newest type, is said to be actually on the way out from England.

Phœnix Foundry Company, Ballarat, Victoria, are keeping very busy, and have just completed their three hundred and fifteenth engine for the Victorian Railways, at a total cost of over £1,000,000.

Markets.—The past month has been a quiet one, and firms are now in the midst of the joys of stock taking, which latter has partly been the cause of fewer large transactions than usual. Your country seems to be having a cut in at the tube trade. Discounts remain unaltered, although the market is a trifle uneasy in its mind as a consequence of American quotations. But why do you not arrange your quotations with more uniformity instead of so many different discounts for so many different sizes? Sydney imports in hardware lines continues heavy in view of import duties following establishment of federation.

Sydney International Exhibition.—There is a strong feeling in Sydney in favor of celebrating the advent of "the United States of Australia" with an international exhibition. These exhibitions, as a rule, are a rather unprofitable tax upon manufacturers, but at the same time if any exhibition should prove profitable to your American traders the Sydney one should "fill the bill." The reason for this statement is that so much added interest, both practical and sentimental, will center in the Sydney show, the former quality being supplied by the hard headed men of business familiar with Australian trade and conversant with its difficulties under present circumstances, with border tariffs restricting trade on every hand—men who would have to be there to pick out the plums which will swell their business under the new condition of federation—while the sentimental side will be readily furnished by warm hearted "young Australia," with its sisters and cousins and aunts, who would undoubtedly regard it as a sacred duty to see the Federal exhibition, just as they do to see the Melbourne Cup, and by their presence, or rather the influence of their shilling admission, insure the success of the show from the promoter's point of view.

The half year just closed has on the whole been a very satisfactory one from a business point of view. The outlook here in Melbourne is a cheerful one. The building trade throughout the colonies is brisk, and real estate values are steadily advancing. The volume of banking business and the profits accruing therefrom are steadily increasing, and this may be taken as a sign of sound trading conditions. Rents and wages are on the up-grade, and labor is well employed to meet the higher prices ruling. Customs collections show a large increase, although this is probably due to increased invoice values as much as to increased quantities of imports. Our farmers are looking forward to higher prices for wheat a few months hence, as the American harvest is reported as not likely to come up to last year's.

F. B.

Bids on Field Guns Rejected.

WASHINGTON, D. C., August 14, 1900.—The Secretary of War has directed the Ordnance Bureau to reject all the bids opened August 2 for 200 3-inch 15-pounder field guns. This action is based upon a protest filed by the Board of Ordnance and Fortification referred to in these dispatches last week, and is regarded as a distinct victory for the Board in a controversy of some standing with the Ordnance Bureau. It is understood that the designs upon which the bids were made for field guns will be abandoned, and the Department will now wait for the Board of Ordnance and Fortification to perfect a new design, which shall be modern in all respects, with a view to equipping the army in the field with a weapon equal to the most efficient guns that have been provided for the leading military powers of Europe.

The protest of the Board against the action of the Ordnance Bureau in advertising for the field guns covered by the proposals recently opened was based upon two contentions—namely, that the design adopted by the Bureau was faulty, and that is no event could a type of gun be selected without the acquiescence of the Board. Some of the most experienced officers of the Department agree with the Board that the design of the Bureau was practically obsolete, and by reason of the rejection of the bids the manufacturers lose orders amounting to several hundred thousand dollars. The most important feature of the decision, however, is its effect in virtually upholding the contention of the Board that neither the Ordnance Bureau nor any other branch of the Department has authority to adopt a type of gun without the recommendation of the Board. This makes the Board the supreme authority on all questions of new ordnance, and justifies manufacturers in declining to enter upon experiments with a view to perfecting guns and other devices unless the same have been approved by the Board.

It is announced that the Board will soon complete a design for a field gun that will meet the latest requirements of this class of ordnance, and which will employ fixed ammunition, a feature that General Miles has stoutly contended for on the ground of both convenience and efficiency. In this connection the members of the Board repel with considerable emphasis the statement made on behalf of the Ordnance Bureau to the effect that the Board has been negligent, and that the Bureau was forced to adopt a type because of the failure of the Board to act. On the contrary, it is stated that the Board has been most diligent, and has gone so far in perfecting a design that a gun is nearly ready for testing at Sandy Hook within the next few weeks. W. L. C.

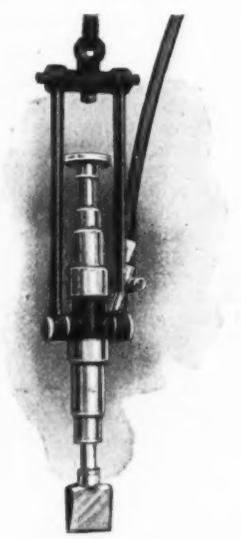
What is regarded as a novel and important movement to avoid labor troubles in the Illinois coal mines is involved in the organization of a corporation entitled the Illinois Coal Operators' Association. The prospectus of the association recently issued states that it is possibly the first voluntary organization in this country of men engaged in industrial pursuits on a large scale, to attempt to prevent friction and settle disputes with their employees by submitting their differences to a commission, whose business it will be to take up the disputes with the representatives of the mine workers' union and settle them upon their merits solely.

The savings banks of New York State, which in their statement last January for the first time reported aggregate resources of $1,000,209,099, now in their statement for July 1 show a further increase of over $37,000,000, the total being reported $1,037,869,160. The deposits considerably exceed $900,000,000, being reported $922,081,596. Last January the deposits were $887,480,650. On January 1, 1897, they were only $718,176,888, so that in the interval since then there has been an increase of over $200,000,000. The Savings Bank Commissioners of Massachusetts have also compiled figures for June 30,

1900, this being a special report made for the United States Comptroller of the Currency. Here also the results show steady growth, though in not quite so striking a way as in the case of New York. The totals run well above $500,000,000—aggregate resources June 30, 1900, being reported $568,674,400. The annual report of the Massachusetts Commissioners is always for the year ending October 31. Comparing with the figures at that date in 1899, we find that the total then was $550,534,731. The deposits now are $533,845,789, against $518,202,048 last October, and $488,642,923 on October 31, 1898.

The Maywood Sand Rammer.

The Maywood Foundry & Machine Company, Chicago, Ill., are placing on the market a rammer for foundry and other purposes that has many novel features, for which applications for patents have been filed. This rammer was invented by Byron B. Carter, a consulting mechanical engineer and designer of machinery, of Chicago, to meet the requirements for rapid work in a modern foundry supplied with compressed air. Extensive experiments have been made to attain the ends of greatest simplicity and reliability, at the same time to have the machine include both the pein as well as the butt heads, either of which might be used at will, and at the same time to have the machine work at any required angle in working around the pattern or cross bars in the



THE MAYWOOD SAND RAMMER.

flasks. The rammer illustrated is the result of these experiments.

There are but three vibrating or reciprocating parts in the machine. The piston and rods, one piece, having the two heads securely screwed and locked on, and all moving together, being considered as one, and the pressure and exhaust valves are the other two. The rammer proper consists of three cast steel sleeves in which the piston and rods work. These sleeves are screwed together with very fine threads, and when brought to the correct relative positions are securely locked by keys. These parts are the cylinder, the center sleeve containing the compressed air chamber, and the exhaust sleeve. Separating these chambers are cupped leather packings which are so made as to be easily removable for examination and replacement. As said, in these sleeves work the piston and rods; on the ends of the latter are screwed the heads, which when fully seated are locked by split pins through the heads and piston rods. Thus the heads are easily replaceable when worn by the sand, yet secure from backing loose when in use. The ports for the air passages to the opposite ends of the piston and to the pressure and exhaust valves are made through the rod itself by a special process. The ports on the exterior of the rods are holes adjoining the ports in the rod. The piston rod passing through the sleeves or valve chambers is made accurately cylindrical, while the other rod is made hexagonal, excepting one side, which is left cylindrical. The bearing or guide for this rod is cast with the cylinder of the rammer and the stem accurately fitted to this guide. The piston and rod are thus prevented from turning in the sleeves, and the pein head is thereby maintained always at a certain relative position to the sleeves. At the same time there can be but one position in which the piston and rod can be inserted into the cylinder.

The valves are made of vulcanized fiber tubing and are split on one side, leaving a groove the entire length of the valve. After being split they are slightly opened and then accurately reamed to fit the rod, holes being made through the tubes at certain positions relative to the ends of the valve, and also to the slot in the side. The lengths of the valves are less than the chambers in which they work by a certain amount, depending, with the openings in the valves, upon the action desired. There being two valves, one for pressure and one for exhaust, any desired action of both pressure and exhaust is easily obtained either by changing the lengths of the valves or by changing the openings relative to each other, or both. The valves, having been fitted while sprung open, will grip the rod with a slight friction when placed on the rod, and will thus remain on the rod at any particular position until moved by some force outside themselves. They will also take up any slight amount of wear they are liable to and thus remain tight, until finally worn out, when they are replaceable at a merely nominal expense. The exterior ports on the rods are drilled at certain positions relatively to the round side on the hexagon rod, and will thus move always on a certain set of lines through the valve chambers. At the same time the holes in the valves are placed at certain positions relatively to the slots in those valves. Thus the valves need only to be prevented from turning to insure the holes always registering with the ports in the rods. This is done by keys which are cast with the sleeves on their interior and are finished to fit in the slots of the valves. All parts are so made that when the sleeves are locked up by the lock keys, the round on the hexagon rod, the ports in the rod and the valves are all in their correct relative positions. It is thus impossible to get the machine together wrong after having taken it apart for cleaning or repair; there are no screws or other small parts to shake loose and derange the machine, and all parts are so simple that immediate repairs can be made in any ordinary well equipped machine shop.

Every part is made to an exact standard and repairs can be furnished to fit any machine at short notice. On the exterior of the center or compressed air sleeve at about the center of gravity of the machine are cast two trunnions accurately fitted by bronze bearings to two strap hangers, these trunnions being in line with the long way of the pein head.

Through the right hand trunnion is an air passage to the interior of the center sleeve and pressure chamber. The right hand hanger strap is fitted with a handle, a controlling valve and connection to attach to the source of compressed air supply. The joint to the trunnion is made with removable cupped leathers and arranged so that full passage of air is secured for all rotative positions of the trunnion and both straps are secured on by collars and bolts. At the top ends the straps are strongly bolted to a heavy cast iron weight, containing an eye bolt for suspending the machine.

This manner of hanging the rammer gives freedom of position for the action of either head from a horizontal to a vertical position, away or toward the operator, and by turning the machine on a vertical axis to any position to right or left. The right hand grasping handle on this strap and controlling the air admittance is practically in the same position at all times, while the left hand grasping the rammer proper guides the blow. The air supply pipe coming from above is never turned, twisted or kinked and needs no atttention from the operator. In service the machine is suspended by a rope, cable or chain, passing over a sheave, with a weight attached at the opposite end nearly counterbalancing the machine, the sheave being attached to a trolley or crane over the work to be done. The heavy weight at the top of the straps, being an inertia mass, takes the force of the blow in both directions, these blows being of equal strength in all positions. In very heavy work the weight may be increased by placing other weights on top of the machine and, of course, equal counterbalancing weights attached to the opposite end of the suspending chain.

Air from the source of supply passing the controlling valve enters through the strap and trunnion into the pressure chamber and surrounds the pressure valve, passing through the port in the pressure valve into the port in the rod to one side of the piston and into the cylinder. The piston thus starts in its stroke and the valve, being shorter than its chamber, moves with the piston and rod, by its friction contact, maintaining the supply port full open until the end of the valve strikes the end of its chamber. The piston moving under the impulse of the air while the valve remains stationary, held by the end of the chamber, the port in the rod passes from under the port in the valve, thereby cutting off the supply at any predetermined point, usually set at about five-eighths of the stroke.

The air, acting expansively, carries the piston still further until the port in the valve for opposite action opens the corresponding port in the rod just prior to the

end of the stroke; then the operation is repeated for the other stroke. A clearance space is left in the cylinder for movement beyond the normal stroke. The air being used expansively makes the machine economical in the use of air, while the positive lead tends to great rapidity of action, and, in connection with the extra stroke allowed, prevents the piston striking the cylinder heads though the machine be held free in the air and be given a full supply of compressed air.

While this action of the pressure valve is taking place the exhaust valve, being exactly similar except for length and position of ports, has a similar action. The exhaust port is kept full open until near the end of the stroke, when it closes, causing an exhaust compression, and then opens the opposite port at about the same instant that the lead of the compression valve commences. The valve action is thus seen to be exceedingly simple and reliable, with no small rods or other devices liable to get out of order, while at the same time very elastic of adjustment for any desired valve action.

The positive lead and cushion also serves another purpose. By holding the machine away from the work, allowing the cushion to absorb part of the blow, the blow on the work may be made very light, while forcing the machine onto the sand causes the full force of the blow to be given to the work.

There is, of course, a position just after the cut off takes place and before the lead opens for the return where, if the machine is stopped, it will not start by turning on the air. But if for this position or any other reason the machine will not start, simply by moving the piston to one or the other end of its travel by means of the heads the valves are readjusted and ready for operation. These machines are at present made in three sizes, styled "A," "B" and "C."

Rammer "A" is for use on small work and strikes about a 50-pound blow at the rate of from 500 to 600 blows a minute. Rammer "C" is for the very heaviest work and in steel foundries. It strikes about a 250-pound blow at the rate of 300 to 400 per minute. Rammer "B" is about midway between. This is when using air at 60 pounds pressure.

Lake Ore Matters.

DULUTH, MINN., August 12, 1900.—There has been a further drop in the ore freight rate, and cargoes have been taken from the head of the lake at 75 cents, which is 50 cents under the season chartering last fall. Though all the ships of the Rockefeller fleet that have been in ordinary since early in the year are still idle, the movement of ore for July was 3,038,560 gross tons, and for the season 9,454,400 tons, or an advantage over last year to the same date of 23½ per cent. Not only were so many of the older vessels of the Rockefeller fleet idle, but the two latest steamships, the "Van Hise" and "Bunsen," both of the largest size, and both finished early last month, have not yet been fitted out, but remain at the shipyards where constructed. It is evident enough that there is tonnage on the lakes to handle the ordinary amount of coal, grain and lumber, and still move 3,500,000 tons of ore monthly. This would appear to indicate that the coming season would see lake rates at a very low point and the shipping berths of the lakes not remarkably well filled by new tonnage.

There will be less ore sent down the lakes the present month than in any of the year so far. Many mines are drawing in, many have stopped stock pile shipment, some have ceased operations completely, and storms on the Mesaba have delayed work for some days at several of the biggest producers there. Still most of the larger mines are not seriously affected by a curtailment, except temporarily and by accident, the cessation of operations being for the most part at new and smaller operations.

President Mather of the Cleveland Cliffs Iron Company tells me that his company are adding to their wood carbonizing plant at Gladstone, where their Pioneer Furnace is located. The addition is to carbonize wood in a new way for this part of the country, by a retort process, somewhat similar to those used in Western New York and Eastern Pennsylvania, that is more effective than old methods. The plant will have a capacity for 50 cords of wood daily. Mr. Mather does not say what the new plant will do in the way of saving by-products over former methods, but I hear elsewhere that it is expected to make a remarkable showing, every cord of wood having been actually shown by the owner of the process to make 59 bushels of charcoal, 240 pounds of acetate of lime and 9 gallons of 97 per cent. wood alcohol. The Cleveland Cliffs Company have an immense acreage of hard woods, many grades of ore, and a desire to develop their properties in a well rounded and thorough manner, and news that they propose branching out in manufacturing should be a surprise to no one.

Mesaba Range.

The Sharon Mining Company have given a contract to the Eastern Minnesota road (J. J. Hill) for hauling the ore from their mine, and will probably follow this by similar contracts on other locations where they may find ore later. The Sharon Mining Company are an ore adjunct for the Sharon Steel Company, now erecting a large plant at Sharon, Pa., and their mine will be outside the general ore pool. It will probably do little but furnish ore for the company's own works. This mine has an average covering of about 72 feet of earth, clay, bowlders and hardpan, yet it is the intention of the owners to strip the ore body and mine largely by the milling process. A preliminary contract for the removal of 400,000 cubic yards has been made, but the removal of the entire overburden that is to be taken off will be a tremendous job. Some of the mine will be worked underground by caving. The decision of this company to strip to such a depth is of interest. It was pointed out a year ago in this correspondence that mines were likely thereafter to carry stripping operations to a far greater depth than ever, and for reasons then pointed out. It is now generally accepted that to a certain depth overburden can be stripped at the rate of 1 foot of earth for every foot of ore below. As the Sharon has considerably more than a foot of ore for each foot of overburden the present undertaking, though involving great cost and much time, is not out of line with the coming practice on the Mesaba range. This company are erecting a village of their own at the mine, are installing water works and other modern conveniences, and propose to be quite independent.

Very heavy rains the past week on the Mesaba range did considerable damage at several mines, including the Oliver, Auburn, Fayal and Biwabik, all large shippers. At the big open pit mines of the Carnegie interest, the Mountain Iron and Oliver, they have been forced to take care of the water in some way other than by letting it run off, and at both mines a pump shaft has recently been sunk in the ore body below the present mining levels, and pumps installed. These lift the water, both surface and underground, and carry it away. As mining is carried deeper it will merely be necessary to deepen the pump shafts a little. The Oliver has stock piled a large amount of low grade ore this year, and is not shipping as heavily as in the past. The mine, including as it now does both the Lone Jack and Norman, has an immense tonnage left.

Menominee Range.

The Chapin mine is employing 1000 men, and will continue this force all the year, although there has been a decrease in shipment by the dropping off of stock pile work. It is probable that far more ore will be carried over into 1901 than was expected when the season opened, and the 1,000,000-ton mark will hardly be reached this year.

A considerable body of ore has been discovered at the exploration under way by Federal Steel Company interests near the Ludington, Iron Mountain. The shaft is down 200 feet, and two levels are being opened. It is probable that the Manilla Iron Company (Federal Steel) will take the old Nanaimo property near Iron River, and explore it thoroughly with drill, though it is found much harder to interest this company than it was a few months ago.

The various properties of the American Steel & Wire Company, in the Crystal Falls district, have either been closed down tight or are running with much reduced forces, and will probably so continue through the year. The Hilltop, which was considered a fine property, is now idle, as are several others. When the Chicago, Milwaukee & St. Paul road gets into position to handle ore from this district it will find little to occupy it for the remainder of this year. Its small ore dock at North Escanaba is to be complete in October.

Marquette Range.

There are some 200,000 tons of ore still in stock at the Queen mines of the Carnegie company at Negaunee. Shipments from stock have ceased for the present at several of the mines of the range. Cambria and Lillie stocks are much reduced, and most of them will be cleaned out. They go chiefly to furnaces of the Republic Iron & Steel Company. The Tilden mine has ceased shipments, all its orders having been filled.

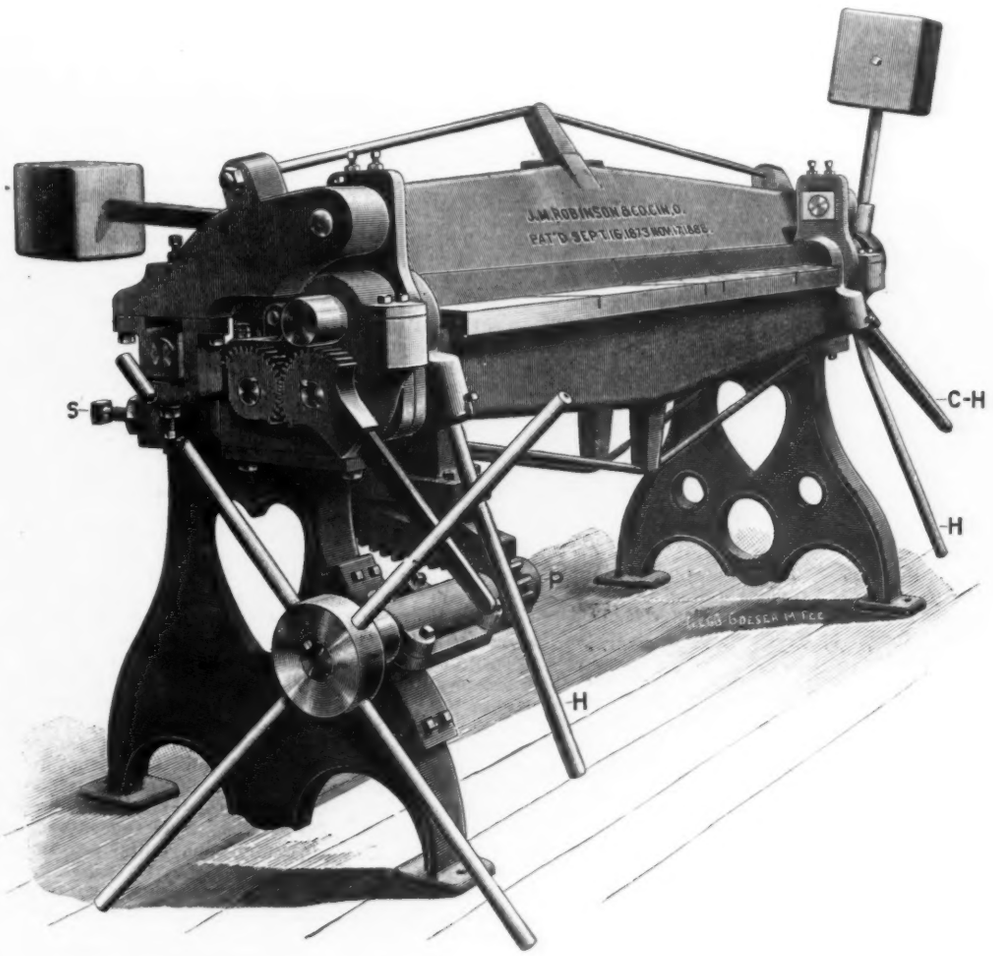
A second crusher, at No. 5 pit, Winthrop mine, has been started up, and is working well. The first, at No. 3 pit, has been steadily in operation for a year without any considerable stoppages for repairs or any other unexpected cause. These are both Gates crushers, which models seem to have become much liked among mining men. The Winthrop, belonging to the National Steel Company, is employing 100 men. At Riverside mine, at Republic, a night crew has been put on, and sinking is being pushed.

An electric tramming railway has been installed at

No. 1 shaft, East Norrie, Gogebic range, the past week. With some little minor changes the system will be a great advantage there. It will be gradually extended through the mine. The company are already operating an electric tram at their Pioneer mine, Vermillion range, which does excellent work. D. E. W.

The Robinson Hand Power Sheet Metal Brake.

J. M. Robinson & Co., Cincinnati, Ohio, are building a brake which will bend No. 10 soft sheet steel and lighter. It is arranged with single gear, and operated by hand for bending No. 14 sheets and lighter in lengths of 8 feet or less. The pilot wheel, consisting of a hub carrying four arms, is keyed to one end of a short shaft, which has a pinion, P, on its opposite end. This pinion meshes with a segment gear secured to the bending bar. When the pilot wheel is turned toward the front the bending bar will come in contact with the bending face of the stop clamp at an angle of 60 degrees. The reverse movement of the wheel returns the bar to its original position. An adjustable stop is provided to arrest the bending bar at any desired angle, thus producing exact duplicate bends. A quick movement of the bar for bending short pieces of Nos. 14 or 16 gauge is obtained by moving the pinion out of engagement with the segment and then operating the bending bar with the handles H H. The back end of the top clamp is journaled to the bottom clamp, which is stationary. The top clamp will swing on its journals in opening and closing, thereby clamping and releasing the material being worked. The clamping and releasing is effected by two eccentrics, which are journaled, one at each end of the bottom clamp base, and which work in steel yokes, the upper ends of which are journaled on pins secured in arms of the top clamp. This forms a powerful grip which is quick in action. The jaws of the brake are on a line with the bending points in order to prevent drawing the material. This clamping device is operated with either handle, C, H, placed at each end of the brake. It is adjustable for light and heavy metal. The top clamp is also adjustable for light and heavy work and for sharp or round corners. This same brake can be easily double geared and operated with hand power for bending No. 10 steel sheets in lengths of 8 feet, with corners a little rounding.



THE ROBINSON HAND POWER SHEET METAL BRAKE.

Half-and-Half Solder.

In the interests of fair dealing and honest nomenclature, it seems in order to call attention to the misuse of the words "Half-and-half" which has grown up in the trade in connection with the manufacture and sale of solder. The term in its strict meaning is intended to denote a mixture containing fifty per cent. of new tin and fifty per cent. of new lead. Yet it is no secret that the words "half-and-half," as very often used nowadays, are made to cover many qualities of solder that are not composed of strictly equal parts of the two metals. The custom of putting on the market, either by manufacturers or jobbers, of solder run in molds and designated as half-and-half, but qualified by a term, such as "commercial," "market," &c., which, to the initiated, means that it is not what it assumes to be, is one that cannot be defended from the point of view of honest dealing. It cannot be otherwise than misleading, even if the majority of consumers understand that in buying a qualified half-and-half solder they are getting something that has a larger percentage of lead in it than of tin. The practice may be defended on the ground that it is a trade custom. But it is a bad custom that suggests deception, and such bad customs should be changed. A solder which contains 55 or 60 per cent. of lead to 45 or 40 per cent. of tin is not in any sense a half-and-half solder and should not be so termed. That much of the so-called "half-and-half" solder now on the market is not what it is called is very evident from the fact that any one to-day can buy grades so denominated at prices which are much below the wholesale value of new tin and new lead at the time of purchase. It is only just to the manufacturers of solder to say that some of them have steadily held up the standard of quality and refused to mark or quote as half-and-half any solder that is not strictly so composed, and they have done so at the risk of losing the custom of some consumers who do not take the trouble to investigate the merits of the case and with

whom price is the first object, regardless of quality. But such makers have established a reputation for their product which gives it an enviable standing with the trade as an honest article that can always be relied upon. —*The Metal Worker.*

The Armor Plate Bids.

WASHINGTON, D. C., August 14, 1900.—The Navy Department on the 10th inst. opened bids for supplying about 36,000 tons of armor for the eight battle ships, six armored cruisers and three protected cruisers authorized by the last naval appropriation acts; but although it was believed, after the reading of the bids, that they formed a satisfactory basis for the allotment of contracts and effectively disposed of all serious problems connected with the construction and equipment of all the vessels contemplated by existing law, Acting Secretary Hackett on the 11th inst. rejected all the bids and has caused an advertisement to be prepared calling for new proposals to be submitted to the Department and opened on October 2. The bidders included the Carnegie Steel Company and the Bethlehem Iron Company, each of whom bid for approximately one-half the entire contract at the rate of $490 per ton, including royalty, for Krupp armor, and $400 per ton for Harveyized, and the Midvale Steel Company, who appeared for the first time as a competitor for a large armor contract, and who bid on the 31,000 tons of improved, face hardened armor required at the rate of $438 per ton, including royalty, if any, and in addition submitted a graduated bid on various lesser quantities of the same grade of armor, though stipulating that deliveries could not be begun under 26 months, and insisting that a total of not less than 20,000 tons should be awarded in order to make the proposal operative. The opening was witnessed by a large number of persons, the majority of whom were prominent officials of the contesting firms, and including President Schwab, Ordnance Engineer W. R. Balsinger, and ex-Lieutenant C. A. Stone of the Carnegie Company; President Linderman, First Vice-President Davenport, Second Vice-President McIlvain, Secretary Schroeder, and Ordnance Engineer Meigs of the Bethlehem Iron Company; Messrs. Sullivan, Petrie and Booth of the Midvale Steel Company, and ex-Secretary Herbert, counsel for the Midvale Company, &c. The bids were opened by Acting Secretary Hackett, assisted by Admiral O'Neil, chief of the Ordnance Bureau, and Chief Clerks Peters and Nagel.

Following is the bid of the Carnegie Steel Company:

Class A. Armor for battle ships and armored cruisers, improved, face hardened, of 5 inches or more in thickness, 15,000 tons (out of a total of 31,000 tons) at $445 per ton, and 200 tons of bolts and nuts at $400 per ton; aggregate, $6,755,000. Charge for royalty, $45 per ton. Deliveries to be commenced within six months from date of contract, and continued at the rate of 300 tons per month thereafter; bolts and nuts to be delivered with the armor to which they pertain.

Class B. Armor for battle ships and armored cruisers; face hardened, of less than 5 inches in thickness, 3800 tons (total of this class) at $400 per ton, and 50 tons of bolts and nuts at $400 per ton; aggregate, $1,540,000. Charge for royalty, $11.20 per ton. Deliveries to be commenced in six months, and continued at the rate of 300 tons per month thereafter.

Class C. Armor for battle ships, armored cruisers and protected cruisers, not face hardened; 1150 tons (total of this class) at $400 per ton, and 20 tons of bolts and nuts at $400 per ton; aggregate, $468,000. Deliveries to commence in six months, and continue at the rate of 300 tons per month thereafter.

Bolts and nuts for above armor (separate bid for total quantity required), 600 tons, at $400 per ton; aggregate, $240,000.

Accompanying the bid of the Carnegie Company was the following explanatory letter:

"Referring to the Department's circular dated June 18, 1900, inviting proposals for furnishing armor for naval vessels we respectfully inclose herewith proposal in duplicate of this company, together with certified check for $50,000, payable to the Secretary of the Navy, in accordance with the provisions of the Department's circular.

"In two letters from the Bureau of Ordnance of July 12, 1900, and of August 1, 1900, we are informed that the weights of the armor as stated in the proposal under Class A and B may be changed by transferring an estimated weight of the thinner plates from Class A to Class B. Our inclosed proposal states the price for about 15,000 tons of armor under Class A. If this amount is reduced as proposed in Bureau's letter above mentioned we hereby agree to furnish one-half of the amount of armor of this class thus reduced at the price stated in our tender for 15,000 tons, Class A.

"It will be further understood that the price we bid for the whole of the armor of Class B would be accepted by us for approximately one-half of the amount of the armor of this class as stated in the proposal, or for about one-half of the amount of the armor of this class if said amount is increased as proposed in the Bureau's letters above mentioned.

"In like manner our bid for the whole of the armor under Class C, and for the total amount of the bolts and nuts, is understood to be also acceptable by us for approximately one-half of said amounts.

"We also respectfully inform the Department that our proposal is made as a whole, and is for not less than approximately 18,275 tons of armor, and bolts and nuts, and we would not agree at the prices as stated in our proposal to furnish less than this amount, which is about one-half of the total amount called for in the proposal.

"If awarded the contract for this armor we propose to manufacture the armor under Class A by what is known as the Krupp process, in which case there are a number of features in the proposed specifications of the Department, dated June 2, 1900, which are inapplicable, and which we would expect the Department to modify to a reasonable degree in order to meet the requirements of this process."

The effect of the above letter is to make a flat price of $490 per ton for one-half of all the armor that may be ordered manufactured by the Krupp process, and of $411.20 per ton for all made by the Harveyized process without reference to the extent to which the Ordnance Bureau may decrease the tonnage of Class A, and correspondingly increase the tonnage of Class B, provided only that the company is awarded one-half of the total amount of the contract.

The bid of the Bethlehem Iron Company was identical in all respects with that of the Carnegie Company, and was accompanied by a letter couched in almost exactly the same terms as those employed in the communication of the Carnegie Company. In brief, therefore, the two companies agree to divide the contract on the basis of $490 per ton for Krupp armor, $411.20 per ton for Harveyized armor, and $400 per ton for untreated armor, and for bolts and nuts.

The Midvale Steel Company presented a graduated bid covering the entire amount of armor, bolts and nuts scheduled under Class A; and the bolts and nuts, but not the armor, under Classes B and C. The bid in detail was as follows:

Class A. Armor for battle ships, and armored cruisers, improved, face-hardened, of 5 inches or more in thickness: 31,000 tons at $438 per ton; aggregate, $13,578,000. 400 tons bolts and nuts at $327 per ton; aggregate, $130,800. 25,000 tons at $440 per ton; aggregate, $11,000,000. 320 tons bolts and nuts at $327 per ton; aggregate, $104,640. 20,000 tons at $442 per ton; aggregate, $8,840,000. 260 tons bolts and nuts at $327 per ton; aggregate, $85,020. 15,000 tons at $454 per ton; aggregate, $6,810,000. 200 tons bolts and nuts at $327 per ton; aggregate, $65,400. 10,000 tons at $466 per ton; aggregate, $4,660,000. 130 tons bolts and nuts at $327 per ton; aggregate, $42,510. 5000 tons at $500 per ton; aggregate, $2,500,000. 65 tons bolts and nuts at $327 per ton; aggregate, $21,255. 2500 tons at $530 per ton; aggregate, $1,325,000. 30 tons bolts and nuts at $327 per ton; aggregate, $9810.

No charge for royalty. Deliveries to commence within 26 months, and continue at the rate of 500 tons per month thereafter.

Class B. 50 tons bolts and nuts at $327 per ton; aggregate, $16,350.

Class C. 20 tons bolts and nuts at $327 per ton; aggregate, $6540.

Bolts and nuts for all armor (separate bid for total quantity required) 600 tons at $327 per ton; aggregate, $196,200.

In further explanation of their proposal the Midvale Steel Company filed the following letter:

"Referring to the Bureau of Ordnance's letter, under date of July 11, 1900, and to the sixth paragraph, in which the Bureau invites alternative bids on about 10,500 tons of Class B armor and about 16,000 tons Class B armor, we beg respectively to submit the following proposition:

"We hereby agree and propose to furnish 10,500 tons Class B armor at $380 per ton, provided we are awarded 15,000 tons Class A armor at the prices stated in our formal proposal, in addition to the 10,500 tons of Class B armor;

"And 16,000 tons of Class B armor at $378 per ton, provided we are awarded 10,000 tons of Class A armor at the prices stated in our formal proposal in addition to the 16,000 tons of Class B armor.

"We are willing to accept a smaller quantity of Class B armor than 10,500 tons at the prices per ton given for this quantity, provided we are awarded in addition thereto a sufficient quantity of Class A armor at the prices stated in our formal proposal to make the aggregate award not less than 20,000 tons.

"The prices stated in our formal proposal for the different quantities of armor are all conditional upon our being awarded not less than 20,000 tons in the aggregate.

"Deliveries for Class B armor are to begin and continue at the same rate as the deliveries for Class A armor given in our formal proposal.

"This letter forms part of our formal proposal."

J. B. Kendall of Washington, D. C., submitted a bid of $360 per ton of 2000 pounds for the 600 tons of bolts and nuts required under the entire contract, making an aggregate of $216,000. No bid for any part of the armor was submitted.

The Carpenter Steel Company also submitted a bid for the 600 tons of bolts and nuts at $445 per ton of 2240 pounds, making an aggregate of $267,000. No bid on armor was submitted.

It will be noted from the letter of the Midvale Steel Company accompanying their formal proposal that that company, while submitting no bid for Harveyized armor, express their willingness to make such armor at $378 per ton, provided they are awarded a contract covering 16,000 tons of such armor, in addition to 10,000 tons of Class A armor, and as a minimum stipulation the company express their willingness to make any quantity of Class B armor less than 10,500 tons, provided the aggregate award received by them for Class A and Class B armor is not less than 20,000 tons. In comparing the proposal of the Midvale Steel Company with that of the Carnegie and Bethlehem companies the Department has scheduled $380 per ton for Harveyized armor as compared with $400 and $454 per ton (the bid of the Midvale Steel Company for 15,000 tons), as compared with $490 for the so-called "improved, face-hardened" armor. As the specifications stipulate ballistic requirements only, and do not require the employment of the Krupp process, the Department assumes some special method of face hardening not heretofore employed is designed to be used by the Midvale Company in producing armor of Class A. Both the Carnegie and Bethlehem companies in their letters state distinctly that the Krupp process will be utilized by them.

The proviso of the Midvale Steel Company that deliveries should not be required under 26 months, taken in connection with the fact that no stipulation was made by that firm concerning the employment of the Krupp process, at first seemed to the officials to be prohibitory, but on closer inspection it was decided that a large portion of the 36,000 tons advertised for would not be imperatively required within two years, and this fact, added to the willingness of the Department to make any reasonable concessions with the view to encouraging the construction of a third armor plate plant, moved the Acting Secretary and the Chief of Ordnance to a decision to reject all the bids, reclassify the armor, and advertise for new bids, with such stated conditions as would probably enable tthe Government to allot a considerable portion of the contract to each of the three bidders. In advertising for proposals the Government reserved the right to reject any and all bids, but this reservation is not invoked by the Department, at least as to two of the bidders. The proposals of the Carnegie and Bethlehem companies are rejected on the ground that paragraph 9 of the Department's circular soliciting bids specifies that "bidders for class A are requested to state not only the price at which they will furnish the larger quantity they bid on, but also the lesser quantities specified." As will be seen, the two companies mentioned made no bids on less than 15,000 tons Class A or an equivalent amount of Classes A and B. The proposal of the Midvale Steel Company is rejected on the ground that the Government cannot wait seven years and nine months for the delivery of all the armor, and therefore cannot accept that company's bid for the total amount of Class A armor. As the Midvale Company also stipulate that they will not accept an order for less than 20,000 tons, leaving about 16,000 tons to be allotted elsewhere, and as neither the Carnegie nor the Bethlehem Company will accept less than 18,275 tons, it follows that the Government cannot consider the Midvale Company's bid for 20,000 tons. The Department officials state that while they regard the prices quoted by all the bidders as high, yet that the rejections are based entirely upon the other considerations above enumerated.

The amended circular calling for new bids will require that proposals shall be submitted, first, for about 7200 tons of armor, nearly all of which shall be Kruppized, for the three battle ships of the "Maine" class; second, for the remainder of the 36,000 tons required for the five other battle ships, the six armored cruisers and the three protected cruisers; third, for the entire 36,000 tons required for all purposes, and fourth, for any quantity of armor up to 36,000 tons which the bidder desires to make. As the armor for the "Maine" class will not be urgently required within one year, and as a very large proportion of the remainder of the armor need not be delivered to the shipbuilders under two years, the Department hopes that all three bidders will be induced to submit modified proposals on such terms that each may receive a part of the contract.

While the result of the bids opened on the 10th inst. has not been conclusive, the officials of the Department express much gratification over the fact that the contractors have seen fit to amend their original resolution not to supply Krupp armor at less than $545 per ton, and it is believed that if the contracts are finally let on the basis of $490, including royalties, for Class A armor, and $411.20 for Class B, there will be little serious criticism in Congress of the Secretary's action. This outcome would dispose of two very serious problems that have confronted the Department for the past two years—namely, the practicability of a Government armor plate plant, and the impossibility of contracting for the hulls of war vessels in advance of the making of contracts for the armor plate designed to protect them. If the Secretary is satisfied with the bids for armor submitted in October he may make contracts in accordance therewith, and may thereafter contract for the construction of all the vessels heretofore authorized, and if willing to accept the figures named by the contractors for armor plate, he is thereby relieved of the alternative of proceeding with the construction of a Government armor plate factory.

W. L. C.

The Duty on Flexible Tubing.

The United States General Appraisers at New York have rendered a decision in the protest of the Compressed Air Machinery Company against the Collector of Customs at San Francisco, Cal., as follows:

The merchandise in question consists of flexible metallic tubing, which was returned by the local appraiser as "manufactures of metal n. o. p. f.," and duty was assessed thereon at the rate of 45 per cent. ad valorem under the provision of paragraph 193 of the act of July 24, 1897.

The importer claims that said merchandise, described in the invoice as iron tubing, is dutiable at the rate of 35 per cent. ad valorem under the provisions of paragraph 152 and section 7 of said act, and that the merchandise described as copper pipe is dutiable at the rate of 2½ cents under the provisions of paragraph 176 and section 7 of said act.

Paragraph 152 provides as follows:

"All other iron or steel tubes, finished, not specially provided for in this act, 35 per centum ad valorem."

The pertinent provisions of paragraph 176 are as follows: "Copper . . . pipes . . . 2½ cents per pound."

In order, therefore, to make either of these paragraphs apply, it is essential that the tubes or pipes shall be made of iron or copper, respectively. If not, they are excluded from those paragraphs. The evidence introduced by the importer not only fails to prove such fact, but clearly and positively shows that the articles are made out of composition metal, under a patented process, and that iron or copper would prove unfit and unsuitable for such articles. This patented tubing is made by putting together two coils of thin metal, between which is placed a thread or string of asbestos. The entire article in its completed form is made to serve where a flexible and portable pipe connection may be necessary in various kinds of factories and industries. It is easily shaped by the hand to fit any form necessary, and can be bent backward and forward at will, and the composition is prepared to permit this to be done without breaking or injuring it. Ordinary metal, whether iron, steel or copper, would not serve this purpose.

Patrick H. Reardon, secretary of the protesting corporation, the only witness called, testified as follows:

"I do not know the metal. The man whom we took the agency from claims it is a special process, non-destructible or breakable. Pure copper would not stand the strain, but if they have some alloy I do not know what it is. It is a patented composition."

From the testimony and samples before us we find that the articles are not made of iron, steel or copper, but are made of composition metal, manufactured under a patented process, and hold that they are dutiable as manufactures in chief value of metal as assessed.

We overrule the protest and affirm the decision of the collector.

It is reported from England that Steel Tin Plate Bars have been sold by American makers to Welsh Tin Plate manufacturers at about $7.50 per ton, delivered at port, under the prices quoted by the local manufactures of Bars. An informal meeting of Bar makers has been held in Swansea to consider the best steps to meet the competition from the United States. It is said that the Tin Plate workmen of South Wales also view the position with some anxiety and that it would not be surprising if their union eventually prohibited the members from working American Bars.

Canadian News.

Quebec Bridge.

TORONTO, August 12, 1900.—M. P. Davis, who has the contract for the substructure of the St. Lawrence Bridge at Quebec, spent a few days on the site of the work at the beginning of the present month. He has now 150 men at work, and expects to have 400 before the beginning of September. It is his intention to have the two anchor piers finished before cold weather arrives. The bridge will stretch from a point just south of the Chaudière on the south side of the river across to Cap Rouge on the north side. Granite quarries at Rivière à Pierre, on the Lake St. John Railway, 60 miles from Quebec, have been secured. Mr. Davis estimates the quantity of masonry at 50,000 cubic yards, 5000 of which will be finished when his men close down about November 15. Besides the two abutments—one on the Quebec, and the other on the Lévis side—there will be two anchor piers and two great river piers, the latter supporting a span of 1800 feet—said to be the longest ever designed by any bridge making concern in the world. The cantilever span on the Forth bridge is 1710 feet, 90 feet short of the St. Lawrence bridge's central span. From each abutment to its neighboring pier the distance is 400 feet, and the anchor spans are 500 feet each. Thus the total length of the bridge from abutment to abutment is to be 3600 feet, rather more than two-thirds of a mile. Though the anchor piers are to be completed this autumn, it is expected that two seasons will be required for the building of the monster piles known as the river piers. Mr. Davis has until October, 1902, in which to get the substructure built. Next May one of the inner piers is to be commenced. Pneumatic caissons, 168 x 50 feet and 50 feet high, are to be built this winter, to be launched when required. Mr. Davis' engineer is A. A. Stewart of New York.

The steel superstructure is to be the work of the Phœnix Iron Company, and will weigh about 40,000 tons. Single pieces will leave the shop of the Phœnix Company weighing as much as 110 tons. The bridge is to have a double track, and the engineers claim that it will bear the weight of as many 150-ton locomotives as can be crowded on both tracks. There will also be a double track tramway and a double track carriage way. The bridge is being built by the Quebec Bridge Company. Aid has been voted by the Dominion Parliament to the extent of $1,000,000; by the Quebec Legislature, $250,000, and by the city of Quebec, $300,000. Its estimated total cost is $4,000,000. Four railways are interested.

Contracts for Torpedo Launches.

Plans and specifications for two steel torpedo launches have been submitted by the British Admiralty to a firm in Victoria, B. C., and the latter have put in a tender for the work. The vessels are to be 50 feet long, with a 12-foot beam and a 6-foot hold. They are to be made of the best steel and fitted with very powerful engines. They are intended for use principally about the Esquimault forts, which are Imperial, not Canadian defensive works, though they are on Canadian territory. It is reported that the Imperial Government is also asking for tenders for extensive work on H. M. S. "Phaeton." Local shipbuilders at Victoria have turned out some good works of late, and have now on hand several important contracts for the northern service, as well as for lines plying to Puget Sound points.

Maritime Boards of Trade.

On the 15th inst. the affiliated Boards of Trade of the Maritime Provinces will meet in annual session in Kentville, N. S. The following is the programme of subjects to be discussed, and concerning which delegates are supposed to be instructed by the local boards they represent:

1. "Preferential Trade Within the Empire."
2. "Development of Canadian Trade With the West Indies."
3. "Curriculum of Our Schools in Relation to Our Industrial and Commercial Advancement."
4. "What Can Be Done to Attract a Desirable Class of Immigrants to the Maritime Provinces?"
5. "Daily Mail Service Between Digby and St. John Throughout the Year."
6. "Better Hotel and Other Accommodations for Tourists."
7. "Rates of Freight on Apples."
8. "Development of Iron and Steel Industries."
9. "Atlantic Mail Service on the Basis of Speed."
10. "Legislative Union Maritime Provinces."

Minor Notes.

Leopold Meyer is expected in Kingston this week, when he is to make definite statements as to the capitalists associated with him, some of whom are believed to be Belgians.

Hopper bottomed coal cars are to be introduced into Canada for the first time, the Grand Trunk having ordered 300 from the Pullman Company.

About 500 men are employed on the New Victoria nickel mine in Algoma. The company propose treating the ore by a new process.

William Mackenzie has returned to Toronto from England, where he went to dispose of the bonds of the Canadian Northern Railway, of which road the Ontario & Rainy River line is a section. He says that the bonds were taken readily. In two months more, he adds, 100 miles of the Ontario & Rainy River road will be completed. Before the close of the autumn, he further promises, the line will be through to the Atikokan iron mines, 145 miles away from its eastern terminus.

C. A. Meissner, assistant manager, and Mr. Wells, the chief engineer, of the Dominion Iron & Steel Company, have resigned. So, likewise, has C. H. Rigby, the company's purchasing agent.

The General Mining Association has raised the price of coal at its Cape Breton mines to $3 per ton, just double what it was a year ago.

The Nova Scotia Steel Company have decided to build a railway from North Sydney to Point Aconi, through the heart of the coal deposits they have purchased from the General Mining Association. A hundred men are at work building coke ovens for the steel company at Sydney mines. C. A. C. J.

The Belgian Nail Industry.

A recent interview in the *Iron and Coal Trades Review* with one of the most important nail manufacturers of Belgium elicited the following data relative to the present relation existing between manufacturers and workmen, the cause of an impending strike among nail workers, and the crisis through which this industry in Belgium is just now passing.

Fontaine-l'Eveque, one of five towns in the Charleroi district, is the principal seat of the nail industry in Belgium. In March of this year the workmen demanded an increased wage for wire drawers and tack makers in all the works in Belgium, and a 10 per cent. increase in wages of workmen of all other categories. This demand may bring about a general strike in all the nail works, as, in the present condition of trade, manufacturers are not likely to grant the demands. Besides, it is considered impossible to fix a uniform tariff of wages, as the means of production differ widely in the various factories. Even in the same factory it would be inapplicable, on account of the organization of work, disposition and system of machines, and aptitude of men operating same.

Workmen are all paid by the job, and earn the following daily average wages: Nail makers, 4.88 francs; stud makers, 5.71 francs; tack makers, 5.32 francs; wire drawers, 5.12 francs; weighers, 4.54 francs. Ten and one-half hours constitute a day's labor.

Prices for raw materials have of late risen, with no proportionate increase in the price for the manufactured article. For instance, the stock price for Paris points—slender, round nails—is less than the price of wire rod.

There are in Belgium, exclusive of two small works situated at Hodimont and Luxembourg, nine nail factories, six of which are at Fontaine-l'Eveque, one at Brussels, one at Marchienne and one at Gentbrugge; but, owing to American, German and French competition, Belgian manufacturers admit their inability to place their surplus production on foreign markets heretofore exclusively controlled by them. The crisis started about two years ago, when American goods began to supplant the Belgian article upon the various European markets.

Belgian manufacturers also admit difficulty in competing against the German Nail Syndicate, who comprise 86 nail works, and who are reported as supplying home orders at high rates, and placing their overproduction for export at whatever price they can get. It is also said that the German manufacturer is favored by an export premium, and also by the entry duty of 15 francs per 100 kg. on tacks.

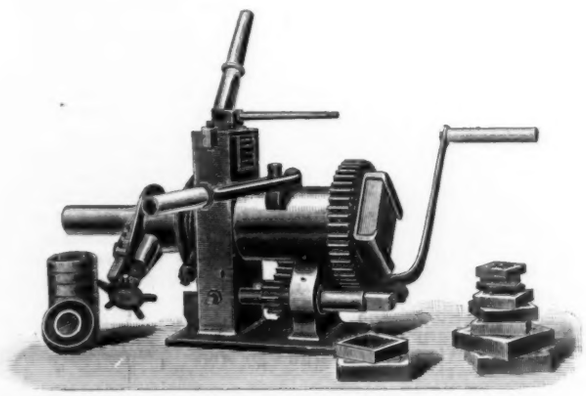
Although the United States furnishes Belgium with wire rod, the difference in price of the cheaper grade American and Belgian article is 5 francs per 100 kg.

At Fontaine-l'Eveque the annual production of nails amounts to 18,000 tons, 9000 tons of which are consumed in the country, the surplus—which greatly exceeds the demand—being held for export.

Belgian manufacturers realize that markets are constantly escaping them, that the tonnage of exports is yearly diminishing, and that they will be obliged to curtail production. They regard with especial apprehension the progress made on foreign markets by American manufacturers during the past few years.

The Douglas Pipe Cutting and Threading Machine.

In designing the Douglas pipe cutting and threading machine account was taken of the fact that the use of a pipe cutting machine carries with it much treatment closely resembling "abuse" at the hands of the unskilled labor employed to operate it. In this machine ample strength and simplicity of construction are conspicuous. It has a solid bed plate by which it can be attached to any bench or plank with two bolts or lag screws. All the gears are machine cut, the small ones being of machinery steel forged solid on the shaft. It is fitted with two speeds, of which the faster one can be used to back off the die after cutting a thread on a large pipe with the slow speed. The ratchet cut off attachment is effective in operation, its knife being automatically fed up to the work by a small star wheel, which engages with a projection from the bed plate provided for that purpose. The chuck is self centering, with drop forged tool steel jaws, and all parts of the tool are interchangeable. The machine, which weighs but 75 pounds, will cut off and thread pipes from ¼ to 2 inches, inclusive, and will cut long screws and close nipples. It



THE DOUGLAS PIPE CUTTING AND THREADING MACHINE.

is manufactured by P. Hollingsworth Morris, 1501 South Fourth street, Philadelphia.

The Siberian Railway.

The following interesting details are taken from the survey of Siberia and the Siberian Railway, which has been drawn up for the Paris Exhibition by the Imperial Commission charged with the construction of the railway:

Up to the beginning of the present year—*i. e.*, within nine full years since the work of construction was commenced—the rails had been laid for a total distance of 3375 miles, which represents a yearly average of 375 miles. This result is to be regarded as highly satisfactory in view of the immense difficulties which had to be overcome in crossing the governments of Tomsk and Yenisseisk and the district of Transbaikalia, which is so frequently subjected to inundations. Siberia is a singularly well watered country, and thus the total length of the bridges which had to be built amounted to 30 miles. The largest of these bridges is that over the Yenissei, which 2520 feet long, and has a span of 420 feet.

With the opening of navigation during the past spring, uninterrupted steam communication between the railway system of Europe and Vladivostock was rendered possible, partly by rail and partly by steamer, according to the following line of route: From Cheliabinsk, the first station in Western Siberia, by rail via Omsk, Tomsk and Irkutsk, to Sretensk, a distance of 2762 miles. This section of the journey comprises the passage of Lake Baikal just beyond Irkutsk. For this passage ice-breaker ferries have been specially built, and they are capable of transporting a complete railway train across the lake. From Sretensk to Khabarovsk by steamer down the rivers Chilka and Amur, a distance of 1443 miles, and lastly, from Khabarovsk to Vladivostock, by rail, a distance of 485½ miles. The entire journey now takes rather more than 17 days.

With a view to rendering the railway journey across Siberia as comfortable as possible, a special service of express trains is running between Moscow and Irkutsk. Nothing is wanted in these trains to minimize the tedium of the journey, for they contain sleeping cars, restaurants, libraries, cars fitted with gymnastic appliances, and pianos, while the attendants are able to speak various languages. In fact, the general comfort of these trains far surpasses that afforded by the ordinary express trains running in Europe. The journey from London or Paris to Vladivostock now takes 24½ days instead of 42 days, via the Suez Canal, to the far East. This great saving of time will be increased considerably so soon as the railway running round the southern end of Lake Baikal is completed. This railway was begun in 1899, as the authorities had then become alive to the great inconveniences likely to arise from the enforced passage of the lake, and is 157½ miles in length. It is rapidly approaching completion.

In 1897 a Russian private company undertook the construction both of the Manchurian Railway, 960 miles in length, and of its southern branch line, 653½ miles in length. It is highly probable that the recent outbreak of disorders in China will hinder the progress of the work on both these lines. The latter line will be of immense importance to Russia, seeing that when it is completed it will be the shortest route between the Siberian main line and Vladivostock and the ice-free harbors of Port Arthur and Dalny (Talien-Wan). With the completion of the above named lines, the oceans that wash the shores of Western Europe and Far Eastern Asia will be connected by thorough railway communication, and the total length of the Siberian Railway and of these branch lines will amount to 5542 miles. The best route for journeying from ocean to ocean will then be as follows: Havre, Paris, Cologne, Berlin, Alexandrova, Warsaw, Moscow, Tula, Samara, Cheliabinsk, Irkutsk and Vladivostock, a total distance of 7467 miles. Six-sevenths of the journey will be on Russian territory—*i. e.*, 4067 miles on the Siberian system, and 2333½ miles on the railways of European Russia; the remaining one-seventh part of the journey will be divided as follows: France, 300 miles; Blegium, 100 miles, and Germany, 667 miles. The line between Perm and Kotlas is used for goods traffic and for opening up communication with the markets of Western Europe. The rate of increase in the traffic on the Siberian Railway is seen clearly from the following figures, which are the returns for the three summer months of the respective years:

	Passengers.	Tons of freight.
1895	211,000	56,509
1896	417,000	181,471
1897	600,000	426,270
1898	1,049,000	688,429
1899	1,075,000	646,968

Among articles of export corn takes the first place, being 42 per cent. of the total exports. In the second rank are meat, poultry and butter, which are conveyed chiefly for the London market in special trains fitted up with refrigerators. Then follow tallow, leather, wool and eggs. Tea forms a special item of the freight; its volume rose from 27,619 tons in 1897 to 35,397 tons in 1898.

The average rate of speed attained by the passenger trains on the Siberian Railway is 23½ miles an hour. At this rate the journey from Moscow to Vladivostock or Port Arthur, a distance of 5333½ miles, will take ten days; the cost of a first-class ticket by the express trains, inclusive of sleeping car, will be 115 roubles, or $60, under the differential tariff now in use. At the same rate, and under the same conditions, the journey from London or Paris to Shanghai will take 16 days at a cost of 320 roubles, or $170, instead of the present journey of from 34 to 36 days at a cost of $500 by steamer via the Suez Canal. The authorities are very sanguine of being able in time to increase the present rate of speed until it shall equal that of the express trains now running in Europe, and then the through journey from ocean to ocean and across two continents will take only ten days. However, so many accidents are constantly occurring, owing to the hasty and inadequate manner in which the track of the Siberian Railway was laid, that almost the whole extent of the line will have to be relaid with heavier rails before any rate of speed at all approximating that of the leading European lines can be looked for. The great economic task now before Russia is to develop Siberia on sound commercial principles, so that it may speedily repay Russia for the immense outlay of 400,000,000 roubles expended in thus bringing Siberia into direct communication with the markets of Europe.

The last number of the official organ of the Ministry of Ways of Communications contains the following details concerning the construction of the Siberian Railway. On January 13, 1900, the total length of the various sections of railway thrown open to regular traffic in Siberia amounted to 2723 miles. This mileage is exclusive of 1565½ miles thrown open for temporary traffic upon the main and branch lines. The work of construction is being carried on on the line between Irkutsk and Lake Baikal, on the Trans-Baikal line, on the line connecting the latter line with the Chinese frontier and on the line connecting the Ussuri line with the Chinese frontier. The sum of 8,500,000 roubles has been assigned for the

work in progress for the present year on the West Central and Trans-Baikal sections of the Siberian Railway. Of this amount 3,000,000 roubles will be expended in increasing the carrying capacity of the line for military purposes, 200,000 roubles will be spent in developing the goods traffic for commercial purposes, and 3,500,000 roubles will be expended in constructing permanent bridges. During the present year the following work has been executed: 473,500 roubles have been spent in building stations and dwelling houses on the Western Siberian Railway, and 431,000 roubles for the same objects on the Central Siberian line. The laying of a water supply on the Western Siberian line cost 448,539 roubles, and the extension of the stations and dwelling houses on the same section cost 694,500 roubles, and 405,050 roubles on the Central Siberian Railway. Iron bridges and stone water courses for the Western Siberian line cost 504,932 roubles. Lighter rails were replaced by heavier at a cost of 1,116,074 roubles for the Western Siberian line, of 837,375 roubles for the Central Siberian line, and of 405,220 roubles for the Trans-Baikal line.

Sooner than was perhaps anticipated, the carrying capacity of the Siberian Railway has been put to the test, and its weakness became at once apparent, for it proved to be unequal to the task of conveying large bodies of troops. Breakdowns of every kind are very frequent throughout its entire length, and the initial faultiness of its construction becomes more and more manifest. The press of St. Petersburg records many complaints made by the officers and army surgeons who have formed the bulk of the passengers from Moscow to Irkutsk during the last three weeks. They complain in strong terms of the dirt and lack of space in the greatly vaunted trains *de luxe*, while from other quarters complaints have been made of the offhand manner in which the attendants serving on the trains perform their duties.

The Susquehanna Iron & Steel Company.

At the first annual meeting of the stockholders of the Susquehanna Iron & Steel Company, Charles A. Porter, president, submitted a report from which we quote the following:

The Susquehanna Iron & Steel Company are a corporation organized under the laws of the State of Pennsylvania, with a full paid capital stock of $1,500,000, divided into 300,000 shares of $5 each. The purpose of organization was to acquire by purchase and to operate certain plants, and your Board of Directors have to report that this company as per their announced purpose acquired possession of the following plants:

Aurora Furnace, Wrightsville	$125,000.00	
Columbia Rolling Mill, Columbia	255,000.00	
Susquehanna Iron Company, Columbia	165,000.00	
Columbia Iron Company, Columbia	170,000.00	
York Rolling Mill, York, Pa	165,000.00	
Vesta Furnace, Marietta	125,000.00	
		$1,005,000.00
Upon the Columbia Iron Company plant there is a dower mortgage of		1,500.00
Making the original investment for the six plants		$1,006,500.00

Aside from the above there is no encumbrance upon your properties.

Subsequent to the purchase of the six plants it was deemed to be to the best interests of your company to acquire possession of the Janson Iron Company property at Columbia, Pa., which would enable us to own the last of the mills in that town, and the better to regulate the question of labor. This was acquired by paying therefor $68,435, which was paid from the amount intended as a working capital—it being the belief of your Board of Directors that the company's affairs could be financed without requesting any increase in the capital stock. In order to put these properties in the best state of efficiency possible there has been expended upon them since acquiring possession in improvements and organization the sum of $63,318.13.

Notwithstanding adverse conditions for a great portion of our year we are privileged to make what we consider a very favorable showing thus far, and the net results for the year are $387,899.34, from which the following dividends have been paid:

No. 1	$90,000.00	
No. 2	90,000.00	
No. 3	45,000.00	
		$225,000.00
Leaving a net surplus June 30		$162,899.34

It may be noticed that the surplus account by comparison with March 31, which was after paying dividend No. 3, $169,273.19, shows at June 30 a difference, and this is so to the extent of $6373.85. This is, however, a difference in name only and not in fact, for nearly 13,000 tons of pig iron on hand is computed at the cost of production (a system in our bookkeeping which we deem conservative), while, in fact, if the quantities of the different kinds of pig iron are computed at a reasonable interpretation of present market prices our material account will be increased in value about $26,000, leaving a net profit for quarter ending June 30 of nearly $20,000.

We submit that we have reason to congratulate ourselves that we are not compelled to make an exhibit which would be serious in the face of the peculiar and abnormal conditions which have prevailed in the trade since January 1, and which have compelled many in the business of iron and steel to close down their plants.

From the undivided profits as of March 31, before alluded to, your Board of Directors deemed it advisable to declare dividend No. 4 to amount of $45,000, and this was paid July 16 last, leaving the net surplus after the payment of such dividend $117,899.34.

You will be interested in knowing how we stand as to business for the immediate future, and it is with pleasure that your management already note a betterment in trade prospects for the month of August, the contracts for which already secured indicate a business of double the volume of the month preceding, and in general it may be remarked that while it is unlikely that the high prices of "middle 1899" will soon again prevail, yet the harmony between raw materials and finished product is so being restored as to reasonably promise a profit for the process of conversion.

The product known to the trade as skelp iron is used in the manufacture of wrought iron pipe. All the plants engaged in pipe manufacture in a very considerable portion of this country have been absorbed by one large company, giving therefore to the makers of skelp iron but one customer for their products. Because of a scarcity of orders the York Mill and the Columbia Rolling Mill were obliged to shut down for a portion of the year, to wit: The York Mill from January 4 to July 28, and the Columbia Mill from the latter part of November, 1899, to January 25, 1900; also during February, May and June and to July 17.

R. Y. Filbert, the treasurer, has submitted the following as the net results of operating the several plants during the year ending June 30, 1900:

AURORA FURNACE.

Sales	$330,195.68	
Operating expenses	276,582.36	
Net profit		$53,613.32

VESTA FURNACE.

Sales	$273,454.67	
Operating expenses	204,253.10	
Net profit		$69,201.57

COLUMBIA ROLLING MILL.

Sales	$520,063.19	
Operating expenses	443,915.13	
Net profit		$76,148.06

COLUMBIA IRON COMPANY.

Sales	$595,632.02	
Operating expenses	496,760.78	
Net profit		$98,871.24

SUSQUEHANNA IRON COMPANY.

Sales	$429,054.36	
Operating expenses	395,992.01	
Net profit		$33,062.35

JANSON IRON COMPANY.

Sales	$366,363.04	
Operating expenses	308,682.37	
Net profit		$57,680.67
Total net profits of the above six plants		$388,577.21

YORK ROLLING MILL.

Operating expenses	$144,783.59	
Sales	144,105.72	
Net loss		$677.87
Net profits of entire operations		$387,899.34

Out of which we have paid the following dividends:

No. 1	$90,000.00	
No. 2	90,000.00	
No. 3	45,000.00	
No. 4	45,000.00	
		$270,000.00
Net surplus after paying all dividends		$117,899.34

BALANCE SHEET.

Assets.

Plants and improvements	$1,138,253.13	
Accounts receivable	192,579.13	
Merchandise	433,976.79	
Cash on hand	26,125.35	
Total		$1,790,934.40

Liabilities.

Capital stock	$1,500,000.00
Accounts payable	128,035.06
Net profits	162,899.34
Total	$1,790,934.40

Note.

Surplus June 30, 1900, as above	$162,899.34
Less dividend No. 4, paid July 16	45,000.00
Surplus after paying all dividends	$117,899.34

The Production of Asbestos and Graphite.

WASHINGTON, D. C., August 13, 1900.—The United States Geological Survey has compiled its annual report upon the production and importation of asbestos and graphite, two products which for many years have been coupled in the Survey's monographs. Through the courtesy of the director the correspondent of *The Iron Age* is enabled to present the following advance abstract:

Asbestos.

Asbestos mining in the United States was confined during 1899 to the two States which have supplied all of the domestic material for several years, California and Georgia. All but a small percentage of the total was from the mines of White County, Ga. The total output in 1899 amounted to 681 short tons, worth crude at the mines $11,740, an increase over a product of 605 tons, worth $10,300, in 1898, and with one exception the largest output, both in amount and value, within the last 15 years. The domestic product of crude asbestos, while very small compared with the imports and the annual consumption, is nevertheless of much importance owing to the fact that it has increased very rapidly within the past ten years, and promises to make greater advances in the near future. The imports, chiefly from Black Lake and Thetford, in Canada, averaged $231,823 per annum for the past 15 years, during which period the use of asbestos in any great quantity has developed. During the five years prior to 1885 our imports averaged $25,563, while in the six years from 1869 to 1874 the average was only $83.

Two distinct minerals are treated in these statistics under the same name. True asbestos is a silicate of calcium and magnesium, and usually occurs associated with soapstone. A very similar mineral in appearance and possessing equal heat resisting qualities is chrysotile, a fibrous variety of serpentine which is a hydrous silicate of magnesium and occurs in well defined veins penetrating serpentine rock. The latter is superior to any true asbestos found in the United States in strength and elasticity of fiber, which recommends it for us in the manufacture of fire proof textiles. It is known commercially as asbestos and is so considered in these reports. Practically all of this material comes from Canada. The domestic product is esteemed as an ingredient in fire proof paints, for packing in the manufacture of fire proof safes, for boiler and pipe covering, and other purposes where strength of fiber is not essential and where non-conductivity of heat is a prime factor.

Reports have been received to the effect that an asbestos company who have acquired interests in the deposits near Casper, Wyo., have done a considerable amount of development work during the past year and expect to be actively mining before the close of the present year. The richness and proximity of the Canadian chrysotile deposits, added to the superior quality of the fiber, have been potential factors against successful operations of our Eastern deposits, while the long distance from the manufacturing centers and the consequent expensive freight costs have militated against the development of the Western localities. The value of the Canadian product for the five years ending with 1898 has been as follows: 1894, $420,825; 1895, $368,175; 1896, $429,856; 1897, $445,368; 1898, $486,227.

Graphite.

The graphite production in 1899 was limited to the same five States from which the product in 1898 was obtained—Alabama, Michigan, New York, Pennsylvania and Rhode Island. The marketed product consisted of 2,900,782 pounds of refined crystalline graphite, and 2324 short tons of amorphous graphite, having an aggregate value of $160,106. The amount of refined graphite in 1899 was not quite 25 per cent. more than that of 1898. The amount of amorphous material produced was nearly three times that of the preceding year. The total value was more than double that of 1898 and more than $55,000, or 50 per cent. more, than the highest value previously recorded, that of 1891. The largest part of the crystalline product was as usual from Ticonderoga, N. Y.; smaller quantities were produced in Chester County, Pa., and Clay County, Ala. The amorphous product was from Rhode Island and Baraga County, Mich. The total value of the graphite product of the United States during the past five years was as follows: 1895, $52,582; 1896, $48,460; 1897, $65,730; 1898, $75,200; 1899, $167,106.

In spite of the rapidly increasing output of the domestic product, up to the present time the imports still far exceed the home production. The imports of 1899 were valued at $1,990,649, being more than the value of the previous five years combined. The principal portion of the graphite imported into the United States is from the Island of Ceylon, where the production in 1899 was the largest ever made. The imports for the past five years were as follows: 1895, $260,090; 1896, $437,159; 1897, $270,952; 1898, $743,820; 1899, $1,990,649. The value of the graphite imported into the United States in 1899 was 12 times the value of the domestic product, notwithstanding the increased production in the United States. In 1898 the value of the imports was ten times that of the domestic product, and in 1897 it was only a little more than four times as much.

An interesting feature of the production of graphite has been the rapid increase in the output of Canada, which, while yet insignificant compared with the world's production, is important because of the growth in the industry shown by the returns of recent years. The latest reports show an annual production valued at about $16,000.

The New East River Bridge.—Bids for the construction of the masonry and steel work for the approaches to the new East River Bridge were opened at the regular meeting of the commission last Thursday. They were as follows: John T. Hall & Co.—Manhattan approach, $1,374,000; Brooklyn approach, $926,000. Hydraulic Construction Company—Manhattan approach, $1,399,000; Brooklyn approach, $934,000. Pennsylvania Steel & Iron Works—Manhattan approach, $1,464,000; Brooklyn approach, $947,000. King Bridge Company—Manhattan approach, $1,440,000; Brooklyn approach, $960,000. New Jersey Steel & Iron Company—Manhattan approach, $1,400,000; Brooklyn approach, $1,000,000. Michael J. Dady—Manhattan approach, $1,678,000; Brooklyn approach, $1,119,500. American Bridge Company—Manhattan approach, $1,650,000; Brooklyn approach, $1,150,000. The bids will be considered at the next meeting of the commission, which will be held on Thursday, August 16.

United States Minister Bryan, at Petropolis, Brazil, informs the State Department that he has protested against the Brazilian law enacted last November forbidding the importation of manufactures that carry labels, prescriptions or trade-marks in Portuguese or partly in that language, as the law would cause serious loss to importers of various kinds of United States goods. July 1 was named as the date for putting the law into effect, but Minister Bryan has obtained a postponement until October 1, and hopes that the Brazilian Congress will repeal the law. Mr. Bryan argues that labels are part of trade-marks, and that consequently the law is in violation of the convention of 1878 between this country and Brazil. He advises that all American importers conform to the requirements of that agreement by registering their marks in Brazil.

The daily papers tell of a record breaking feat performed on the Toledo docks of the Hocking Valley Railway on August 2 in a 24-hour record for coal hoisting. Two Brown hoisting machines in 22 hours' actual working time are said to have transferred the contents of 403 cars, a total of 13,705 tons of coal, to boats lying at the company's docks. This beats a former record of 11,772 tons. The record would have been still further augmented, so it is claimed, but for the fact that the coal was cut up between five boats.

The National Roofing & Corrugating Company of Wheeling, W. Va., who were incorporated last week, are authorized by their charter to manufacture and deal in Metal, Black Plates, Steel, Iron, Tin and Terne Plates, &c. The capital subscribed is $500, with the privilege of increasing the same to $5,000,000. The incorporators are: G. E. Needham, Cleveland, Ohio; E. Langenbach, Canton, Ohio; A. J. Hyndman, Cincinnati, Ohio; Frank G. Caldwell, Wheeling, W. Va., and R. T. Scott, Cambridge, Ohio.

Samuel H. Cramp of the William H. Cramp Ship & Engine Building Company, who is in London, denies the report that his company are to be consolidated with the Harland & Wolff Company of Belfast, Ireland. This denial is made because the report had received some credence in shipbuilding circles.

The New Niagara Power Plant.

The National Contracting Company are making splendid progress on the construction of the big new power wheel pit at Niagara Falls, and the hole has reached a depth of 75 feet out of a total depth to be of 180 feet. When the Niagara Falls Power Company came to see the necessity of constructing a second wheel pit, the prospective demand for power was so great that it was recognized that there would be an early market for the entire power output of this second pit, and so contracts were entered into calling for the completion of the slot as fast as it could be built. In a previous issue *The Iron Age* gave the dimensions of the pit. It will be 463 feet 1 inch long between channel cuts, and the width between the walls will be 16 feet below the turbine deck and 17 feet 4 inches above this deck. The walls are to be channeled, and the pit is to be lined with brick throughout great care being taken to provide properd drainage for the walls. In the new pit there will be installed 11 turbines of 5000 horse-power each, making the total output of the pit 55,000 horse-power, which, added to the 50,000 horse-power in the present pit, will give the Niagara Falls Power Company a total power output of at least 105,000 horse-power.

The contract for building a shaft and extending the tunnel for a distance of 616.5 feet was sublet to A. C. Douglass, who has already sunk the shaft, and has taken out 200 feet of the upper bench of the tunnel extension, which is being built of the same section as the original tunnel, about 18 feet wide and 21 feet high in the form of a horseshoe.

Since *The Iron Age* last referred to this great work, a Lidgerwood cable way has been erected over the pit to aid in hoisting the excavated material. At one end of the pit a tower 30 feet high has been erected, and at the other end a 60-foot tower has been built. The distance between the towers is 600 feet, but the total length of cable used is 840 feet, the size of the steel cable being 2½ inches. The buckets used on the cable way carry 2 cubic yards. They are run up close to the high tower and over Goodwin gravity dumping cars, into which the muck is dumped, the operation being controlled entirely by the engineer located close by. The excavated material is conveyed to the trestle of the Niagara Junction Railway, where it is used to make a road bed preparatory to the line being double tracked, a fact which of itself is most significant of the increased business being done on the lands of the Niagara Falls Power Company.

The 550-foot coffer dam in the inlet canal in front of the new pit has been completed, and behind the canal wall excavation for the inlets is going on. On one side of the pit the masonry is quite advanced. As this work is done all the necessary castings that will be required for bearings, struts, &c., are placed in position, the work requiring the very greatest accuracy.

To carry out their contract the National Contracting Company have erected a very extensive plant. This includes 4 Straight Line Ingersoll air compressors of the type known as "Class A," 10 100 horse-power boilers, 10 Sullivan Machine Company's channeling machines; 6 Ingersoll-Sergeant rock drills, 3 Ingersoll-Sergeant gadding machines, 2 30-ton locomotives, 40 dump cars, 3 Goodwin gravity dumping cars, 10 derricks and hoisting engines, 1 Byer's traveling derrick, a mile and a quarter of railroad track, switches and sidings. The air compressor plant is pointed out as one of the best ever erected in the country.

In the course of the work about 68,000 cubic yards of rock will be removed from the pit and 13,000 cubic yards from the shaft and tunnel extension. About 32,000 cubic yards of earth will be taken from the pit and the inlets. In the construction there will be used 1,400,000 pounds of iron and steel castings, pipes, girders, &c. The masonry calls for about 6000 cubic yards of cut stone. About 10,000 yards of Portland cement concrete will be used and 13,000 yards of brick will be placed, calling for about 7,500,000 brick. These are some of the important items of consumption in connection with the contract.

The local manager of the work for the National Contracting Company is Walter McCulloh. The consulting engineer of the National Contracting Company is George B. Burbank of New York, who was chief engineer of the Cataract Construction Company during the time of building the tunnel. The interests of the Niagara Falls Power Company are watched by William A. Brackenridge, resident engineer of that company at Niagara Falls. Engineer Brackenridge and Dr. Sellers some time ago went to Europe to lay before the designers of the turbines now in use certain changes they desired to suggest in the making of the turbines for the new pit. Just what these changes are to be is not yet given out, the engineers being still at work on the details, but it is understood that the ideas of Messrs. Sellers and Brackenridge have been carried out.

THE WEEK.

A press dispatch from Managua, Nicaragua, says that the representatives of the Inter-Oceanic Canal Company have been unsuccessful in their efforts to get an extension of time for depositing with the Government of Nicaragua $400,000 in gold and beginning the construction of a railroad and canal across the country.

The report of the Department of Agriculture on the condition of the various crops of the country on August 1 indicates an increase in the total yield of wheat, as compared with the position shown on July 1, of 3,600,000 bushels, owing to rains over the spring wheat area. In corn, however, a reduction of some 50,000,000 bushels is shown in the promised production. The promise, however, in regard to this grain is still a most satisfactory one, namely, 2,190,790,000 bushels, a total only once before exceeded. The wheat promise is 513,997,000 bushels, a decline of 33,000,000 bushels from last year's production.

The Comptroller of the Treasury, in a decision given last week, holds that a common carrier receiving goods for shipment, although not acompanied by a bill of lading or shipping directions, is liable for their loss as such common carrier, provided there was no unreasonable delay by the shipper in furnishing the necessary shipping directions.

A large export oil tank has just been completed at the port of Sabine, Texas, having a capacity of 1,500,000 gallons of crude oil for fuel purposes. The plant is a complete one, with pumps, sidings, piping, &c. Twenty-two cars of 6000 gallons capacity each can be emptied in about two hours; the discharge capacity is about 10,000 gallons a day, the vessels lying in the slip getting the cargo through pipes. The plant is owned by J. S. Cullerain & Co. of Corsicana, Texas.

A report to the British Foreign Office states that the Governor of Samoa has formed a committee of seven members to advise the administrative authority of the Protectorate on questions relating to trade and agriculture. The committee is composed of European residents engaged in commerce and in the cultivation of land, and will be the means of submitting to the Governor any suggestions emanating from the European population for the improvement of the condition of the Protectorate.

The steamship "Sonoma," built for the Oceanic Steamship Company, was successfully launched at the Cramps' shipyard, in Philadelphia, on Tuesday. She will ply between San Francisco and Australia. The "Sonoma" is the largest merchant steamer ever built on the Atlantic Coast, the "St. Louis" and "St. Paul" excepted.

The North German Lloyd steamer "Kaiser Wilhelm der Grosse," which sailed from New York August 7 for Bremen, made the record passage of any steamer sailing from Sandy Hook to Cherbourg, covering 3184 knots in 5 days, 19 hours and 44 minutes. Her average speed was 22.79 knots per hour.

The new electric line of the Orleans Railway Company in Paris, which is operated by electricity, and is 4 km. in length, runs from the Austerlitz Depot to the Quai d'Orsay, and is underground for its full length. An electrically operated transfer platform 9 m. long connects all the tracks on the Quai d'Orsay. This platform can carry electric locomotives of 50 tons. The amount of power required for these locomotives is 500 kw., and the current is supplied through a third rail from three sliding contact shoes, while overhead wires are utilized at the d'Orsay Depot, and also for the switches. The power station at Ivry contains two electric generators of 1000 kw. each, producing a three phase current of 5500 volts pressure and a frequency of 25 alternations per second. Two substations transform this alternating current into a continuous current of 550 volts for power purposes, and of 500 volts for lighting. The arc lamps are connected in series. The incandescent lamps are in four shunts supplied by a distribution system of five conductors from equalizing dynamos (boosters). There are two Tudor storage batteries of 1100 ampere hours, of a capacity sufficient to regulate the load and to take up any sudden changes in the same; they are able to furnish light for several hours in case of a machinery break down. The line has been in operation and open to the public for several weeks.

The Iron Age

New York, Thursday, August 16, 1900.

DAVID WILLIAMS COMPANY, - - - - - - PUBLISHERS.
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RICHARD R. WILLIAMS, - - - - - - - HARDWARE EDITOR.
JOHN S. KING, - - - - - - - - BUSINESS MANAGER.

International Standard Specifications for Materials.

We are glad to observe what an active interest American metallurgists and engineers are taking in the work of bringing order out of chaos in the matter of specifications for materials of construction. Splendid progress has been made in this country, and this summer a vigorous campaign has been inaugurated by Colby, Webster, Hunt and others in behalf of international standards. The congress at Paris, to which we have alluded in a recent issue, offered an excellent opportunity for preliminary work, and it is understood that a further conference at Glasgow at the occasion of the exposition there will be utilized for renewed efforts. It will not do to underrate the influence of the inertia to be overcome, particularly in engineering circles. In our own country we have striking instances of conservatism and obstinacy on the part of men who are in a position to dictate the requirements for material. In Europe it is still a matter of professional pride and of business policy, with many consulting and constructing engineers, to draw up special specifications differing, sometimes in only minute points, from those more widely adopted. Government engineers, too, frequently seek to avoid any possible danger of trouble by declining to receive at all material produced under special conditions. We have the example of Lloyds, which until recently would not touch basic steel under any circumstances. Lately they do accept basic open hearth metal, while still rejecting utterly basic Bessemer.

Then, probably we may expect some working at cross purposes among manufacturers themselves. We may expect the German steel makers to insist that basic Bessemer steel be accepted without reserve for all purposes. As a matter of fact there were some pretty sharp passages between representative makers and a large boiler manufacturer at a recent meeting over the statement made by the latter than basic Bessemer steel was not suitable for boiler manufacture.

Of course, to our makers, as newcomers in the world's markets, laboring to some extent under the disadvantage of being at a distance from their customers, standard specifications would be a great blessing. It would greatly simplify their business and to that extent would promote our growing export trade. Standard specifications would, too, aid in the direction of cheapening cost by promoting the production of a large tonnage. These advantages would, of course, accrue to European makers as well, and all, in the nature of things, would share the money saving with their customers. It is not unnatural that the manufacturers are quicker to realize the benefits of the establishment of international standards, and that the initiative must come largely from them and from their metallurgical engineers. With the latter, however, rests the burden of the technical campaign, and they should continue to receive the encouragement and the support of the manufacturers all over the world.

Business Co-operation.

Among the laws of the natural world none are more thoroughly established and recognized than that of the survival of the fittest. Whatever may be our own views as to the wisdom or mercy of this law, it would be idle to deny its far reaching and unceasing action. While, upon superficial examination, it seems to be purely cruel and cold blooded and merely the apotheosis of might, yet upon closer examination it is seen to be the prime cause of progress and improvement and that no advancement is possible without its constantly eliminating influence.

If it be accepted as an axiom, certified to by centuries of experience, that the conduct of commercial affairs, to be permanently successful, must be based, as far as analogy permits, upon the laws of nature, then the problem which confronts us is, how far the conduct of the business world should be affected by the operation of the law of the survival of the fittest.

The question is to what extent we can safely modify its action in the interests of humanity and still preserve sound business principles. Even the most casual observer cannot fail to note the steady drift in commercial circles toward co-operation between employers and employees, and the trade journals are full of profit sharing schemes, pensioning schemes and every plan that ingenuity and philanthropy can suggest. It is equally noticeable that very few of these plans have more than a temporary success, since in the main they refuse to recognize existing conditions and attempt to subvert natural laws by the substitution of well meant but impracticable plans.

It is encouraging to note that, notwithstanding these innumerable failures, there seems to be no discouragement nor any tendency to revert to original conditions and to base all dealings upon the somewhat familiar and cold-blooded phrase, "Business is business." The truth is that there is a tacit but somewhat inarticulate recognition of the fact that existing business conditions as regards the relations between employers and employees are very far from what they should be and must finally be settled, not only upon economic laws, but by the application likewise of well considered and judicious humanitarianism. What such settlement will be is beyond the prescience of any living man to divine, but we can at least anticipate some of the elements which will enter into its composition. It will certainly recognize facts and will not attempt to ignore competition, nor will it include those illusive but well meant plans which tend to destroy individuality, to shackle personal ambition and effort, and to make no distinction between the drones and the workers. Most of all will it have as its foundation the requirement that no philanthropic plan can ever be worth while unless it involves justice rather than charity, and that the success of such plan must be bound up in the moral and financial success of the business itself.

On the exportation of shot cartridges manufactured by the Winchester Repeating Arms Company of New Haven, Conn., the shot entering into the manufacture of which is made wholly from imported lead, a drawback has been allowed equal in amount to the duty paid on the lead so used, less the legal deduction of 1 per cent.

For the year ending June 30, 1900, the Wolverine Copper Mining Company produced 4,756,646 pounds of copper, which sold at 16.86 cents per pound, the cost being 9.56 cents. Dividends of $240,000 were paid. The rock stamped yielded 1.288 per cent. of copper.

The Hadfield's Steel Foundry Company, Limited, of Sheffield, have increased their capital stock to £400,000 by the issue of 90,000 ordinary £1 shares at £1 10s.

OBITUARY.

COLLIS P. HUNTINGTON.

The sudden death, on August 14, of Collis P. Huntington, president of the Southern Pacific Railroad Company, has removed one of the most famous railroad men and financiers of the country. Mr. Huntington passed away from an attack of heart disease while sojourning at his summer camp, "Pine Knot," in the Adirondack Mountains. Collis Potter Huntington was born at Harwinton, Litchfield County, Conn., on October 22, 1821. He left school at the age of 14 and for some years traveled about in the South peddling merchandise of one sort or another, almost invariably with success. At 21 he entered into partnership with his brother in a general store in Oneonta, N. Y., but in 1849 he started for California with the intention of selling supplies to miners. After some disappointment at San Francisco he went to Sacramento. There he began business in a tent and was at once successful. Not long afterward he met Mark Hopkins, and with him formed a partnership to deal in hardware and general merchandise under the title of Huntington & Hopkins. The business was successful and in a few years the partners, with Leland Stanford and the Crocker brothers, had become the leading business men of Sacramento. It is said that in 1854 Mr. Huntington had made $800,000, a quarter of this sum having been made in powder speculations. In 1855 Mr. Huntington, with Charles Crocker, T. J. Judah, Leland Stanford and Hopkins and others, advanced $35,000 to complete the survey of a trans-continental railroad. As a result the Central Pacific Railroad was organized in California in 1860, and two years later Mr. Huntington came to New York to secure capital for the venture. From that time on he was a prominent figure in railroad and financial circles. Large bonuses to assist in the work were secured and the Central Pacific was built. It stretched from San Francisco to Ogden, Utah, a distance of 1359 miles. It was the great desire of Mr. Huntington to have a transcontinental line connecting the Atlantic and Pacific. The many branches of the Southern Pacific Railroad Company were built, and a connection between Galveston, on the Mexican Gulf, and San Francisco was made. This was extended to New Orleans and a gradual consolidation of these different lines was effected. From New Orleans Mr. Huntington began operations east of the Mississippi, and the Chesapeake & Ohio Southwestern, bringing him into connection with the Atlantic Coast, was made. He was not as successful with his Eastern enterprises as he had been with those on the Pacific Coast, for the Chesapeake & Ohio soon developed into a property which did not pay expenses. Mr. Huntington subsequently sold out his interests in the line and devoted his energies to the properties which were ultimately consolidated in the great Southern Pacific Company, formed in 1884 with a capital stock of $150,000,000. Among the other great enterprises which owe their establishment to him are the Pacific Mail Steamship Company and the Newport News Dry Dock & Shipbuilding Company of Newport News, Va. The plant of the last named concern is considered to be one of the best equipped in the world for building ships, and a number of the finest American merchant steamships as well as several vessels of war have been built there. In all it is estimated that there is expended at Newport News about $9,000,000, and it was Mr. Huntington's intention to construct at that point a large steel and iron plant for manufacturing all kinds of structural steel and iron, besides other forms of manufactured steel commodities. At the time of his death Mr. Huntington was president of the Southern Pacific Company, the Pacific Mail Steamship Company, the Guatemala Central Railroad Company and the Southern Pacific Railroad Company of California, and a director in some 12 or 15 other railroad and steamship corporations.

ALEXANDER STACKHOUSE.

Alexander Stackhouse, chief of the Cambria Steel Company's motive power for many years, ex-Treasurer of Cambria County, Pa., and brother of Powell Stackhouse, president of the Cambria Steel Company, died at Johnstown, Pa., August 14, of typhoid fever. He was born near Philadelphia, of Quaker parentage, 50 years ago.

FRANCIS MULHERAN.

Francis Mulheran of the firm of Mulheran & Shields, Atlantic Basin Iron Works, Brooklyn, N. Y., died on August 8 at his home in Jersey City, N. J., of typhoid pneumonia, superinduced by an accident met with three weeks previously on board a steamer. Mr. Mulheran was born in Ireland 49 years ago and came to this country when a boy. He was one of the best known machinists of New York and was for many years foreman and master mechanic for the John N. Robins Company. A year ago he went into business for himself.

ROBERT S. HUGHES.

Robert S. Hughes, secretary and treasurer of the Rogers Locomotive & Machine Company of Paterson, N. J., died on Saturday, August 11, at his home in that city at the age of 73 years. For over 50 years Mr. Hughes, who was a native of Paterson, had been connected with the locomotive business, entering the employ of Rogers, Ketcham & Grosvenor in 1847, and subsequently connecting himself with the Rogers brothers.

WILLIAM HOWARD.

William Howard, a veteran hardware merchant, died at his home in Watertown, N. Y., on the 26th ult. Mr. Howard was born in Springfield, Mass., in 1826. In 1849 he came to Watertown, where he established himself in the Hardware business, which he conducted successfully until his retirement last May.

ROBERT THOMAS.

Robert Thomas of Newtown, L. I., who died on August 8 at Luthgow, N. Y., at the age of 77 years, was for many years a large manufacturer of wrought iron work in the Williamsburg district of Brooklyn, N. Y. In 1877 he retired from business. Mr. Thomas was a native of England and came to this country when young.

Commercial Methods in Australia.

United States Consul F. W. Goding, at Newcastle, Australia, in a report to the State Department, calls attention to the rules governing trade between Great Britain and the Australian colonies. If American shippers, says the Consul, desire to build up an export business with Australia, they must remember that the following customs prevail:

1. Most Australian business houses have their own branches in London, doing all their British and foreign buying; or they have an agent or buy direct from the manufacturers.

2. Terms of payment are arranged in several ways. Where branch houses are established the suppliers deliver their orders at the ship's side, handing the buyer the ship's receipt with their invoice. The accounts are then payable in 30 days less a discount of 2½ per cent., or in seven days less 3 per cent. This custom also applies to agents' transactions, where, of course, the agent receives a commission for his services. Where there is neither a branch office nor an agent a letter of credit is, as a rule, established with a banker, and the supplier's draft against documents at 90 to 120 days after sight is paid, the charge for exchange being paid by the buyer here.

3. Another system is for the merchant here to instruct his banker to receive documents for any shipments, naming the firm supplying, and to pay cash for the face value, collecting the money from the merchant here on receipt of documents by mail. This is done only when buyers and suppliers are well known to and on the best terms with each other.

4. Another custom prevails by which an indent is forwarded direct to the supplier or manufacturer, with instructions to present documents at a bank or office and obtain from 75 to 80 per cent. cash, and to draw at 60 to 120 days for the balance, including prepaid freight. This, as a rule, applies to transactions between people not so well known to each other.

5. In some instances merchants will remit a bank draft (for the estimated value of an indent) direct to the supplier, with the object of getting extra discounts; but this is done only when the merchant has plenty of spare cash and the supplier is well known and has the reputation of being absolutely safe.

6. One other method is employed in first transactions only. Either a bank reference, a letter of credit or a draft for the full value of the purchase is demanded as a mark of good faith, pending proof of the position of the buyer.

There are times when special arrangments are desired for special countries; but as a rule the above covers all wants, and a London or New York draft on any bank of good repute is considered as good as gold. Consul Goding says he has gone into details in this matter because he is sure that unless our exporters study the methods employed by British merchants they will never build up a great export business here. He firmly believes that our export business depends upon a thorough knowledge of the principles stated above.

It is estimated that the war in South Africa has already cost the British nation between $300,000,000 and $350,000,000 in money.

PERSONAL.

Frederick P. Spaulding of Bethlehem, Pa., who has been appointed professor of civil engineering in the University of Missouri, was graduated from Lehigh University in 1880. He was an instructor in Cornell University for seven years, and later joined the staff of Lehigh University, where he remained for two years. He then entered the field of practical engineering.

W. R. Webster, the well-known consulting engineer, of Philadelphia, has returned from Europe, where he has taken a very active interest in promoting the introduction of American standard specifications for iron and steel.

Frank L. Brown, who has been for many years identified with the wire trade of the Pacific Coast, has resigned his position as Pacific Coast sales agent of the American Steel & Wire Company. Mr. Brown has been appointed general sales agent of the Shelby Steel Tube Company, of whom C. T. Boynton, the former general sales agent of the American Steel & Wire Company, is president. For some time to come Mr. Brown's headquarters will be in Chicago.

The friends of Samuel Thomas of Catasauqua, Pa., will be glad to learn that he is now progressing slowly toward health and strength after six weeks' dangerous illness.

Lehman B. Hoit has resigned as Cleveland sales manager of Henry R. Worthington, and will engage in steam, electrical and hydraulic engineering, with offices at 729 Society for Savings Building, Cleveland, Ohio.

W. J. Taylor of the Taylor Iron & Steel Company sailed for Europe on the steamer "Deutschland" on the 8th inst., and Walter Gaston, the general manager, sailed on the "Majestic" on August 1. Both are expected to return before October 1.

John Thomson, president of the Engineers' Club of New York, has returned from Europe.

E. O. Hopkins, who has been receiver of the Peoria, Decatur & Evansville Railroad at Evansville, Ind., has been elected president of the Sloss-Sheffield Steel & Iron Company of Birmingham, Ala., to succeed Sol. Haas.

Charles Hansel has accepted the position of general manager of the General Power Company, Woodbridge Building, New York, who manufacture the Secor internal combustion gas and kerosene engines.

Trade Publications.

Gold Washer.—A circular from the W. J. Clark Company of Salem, Ohio, describes their mechanical gold washer for the cleaning up of gold and silver mills, where the residue from batteries and pans, consisting of concentrates and iron worn from shoes, dies, &c., mixed with free gold or silver and amalgam, has heretofore been cleaned up by hand panning. With this machine one man can clean 10 to 20 times as much as can be done by the ordinary hand pan, and when operated by two men it will wash from 200 to 300 cubic feet of material per day. It will catch fine gold that could not be saved by hand panning. It can be taken apart easily and packed in the lower pan without boxing, and measures when thus packed 15 inches high by 18 inches wide by 4 feet long, and weighs 250 pounds.

Heater and Purifier.—The Ward Heater Company of Detroit, Mich., have issued a catalogue descriptive of the Frontier heater. This heater is of the open type, since this is considered the most perfect purifier, for the reason that to separate lime, &c., held in solution certain gases must be driven from the water. This cannot be done when the water is under pressure, as in the case of closed heaters. It is stated this heater acts as a perfect water catcher and the steam passes off comparatively dry.

Molding Machine.—We have received a catalogue from the Syracuse Malleable Iron Works, Syracuse, N. Y., describing the Burns Economic molding machine. The machine takes a flask from 11 x 13 inches up to and including 11 x 21 inches more successfully than by hand ramming. Castings are made on it from a card of 90 pieces in a mold which, when sprued, weighs ½ pound to a casting of 50 pounds. It can be quickly adjusted to any style of pattern with light or low copes or drags with deep or shallow flasks.

Gas Engines.—We have received a catalogue from the National Meter Company of 84 Chambers street, New York, descriptive of the Nash gas and gasoline engines. This engine is shown in one, two and three cylinder types, in sizes up to 150 horse-power. Several views are presented showing the engines direct connected to dynamos for storage battery or electric power.

Combination Bench and Pipe Vises.—The Bignall & Keeler Mfg. Company, Edwardsville, Ill., are sending to the trade a very tastefully designed booklet descriptive of their line of Peerless Combination Bench and Pipe Vises. They make two patterns of these vises; those known as No. 1 for ⅛ to 2 inch pipe, and No. 2 for ⅛ inch to 3 inch pipe, having a swivel base on which the Vise may be rotated to line the jaws up with length of bench or at any angle thereto. The No. 3 for ⅛ to 4 inch pipe and No. 4 for ⅛ to 6 inch pipe have fixed base which is immovably secured to the bench. They call attention to the fact that the pipe jaws are held in place by screws, and not by riveted pins, and that therefore they may be quickly removed and the vise used for ordinary bench work to the full depth of the throat. Incidentally, mention is made of their line of Peerless and Duplex Pipe Threading and Cutting Machines, which they say they have been making for 20 years past.

"Our Machines: Our Tools."—We have received from the Brown & Sharpe Mfg. Company of Providence, R. I., an exceedingly interesting pamphlet, bearing the above title, which was prepared by them as a souvenir for those who visited their exhibit at the Paris Exposition, and which contains a brief history of the growth of the business, together with the development of their machines and tools. This business was begun in 1833 by David Brown and his son Joseph R. Brown. The former retired in 1841, and the business was conducted by the latter until 1853, when Lucien Sharpe became his partner and the firm of J. R. Brown & Co. were formed. This firm were incorporated in 1868 under the name of the Brown & Sharpe Mfg. Company. Twenty years after the founding of the business, although the company had earned the reputation of producing the best and most accurate work, their total floor space was only 1800 square feet, and in 1857 their total force consisted of only 20 men. A large part of their time was then devoted to watch repairing and the making of small tools for jewelers' use. From 1859 their growth as a manufacturing concern was rapid, and the buildings, never well suited to the purpose, became crowded. In 1872 there were more than 300 men employed, and they decided to move to the present location. The plant has continued to grow until the present buildings, which are among the best in America for manufacturing purposes, have a floor space of about 7 acres and more than 2000 men are employed. They now have in course of erection a new building five stories high with a floor space of 1½ acres that will be completed in the fall. This building will have accommodations for about 500 men. To provide for the constantly increasing demand for skilled workmen they have a large and well organized apprentice system. The apprentices are organized into an association and hold meetings from time to time in an assembly room in the works. These meetings are held during working hours and are addressed by men of pronounced mechanical ability, or the time is occupied by debates on subjects connected with the work. The apprentices are in charge of a competent man, who, in addition to their usual training, carefully superintends the work of each, also aiding by suggestions in the pursuance of studies and recreations outside the working hours. Then is presented a brief history of the growth of the milling and grinding machines, measuring machines, micrometers, milling cutters, &c.

Pneumatic Tools.—A circular has been received from the Chicago Pneumatic Tool Company of Chicago illustrating the wide application of their pneumatic tools. These consist of riveters of different types and riveting hammers. The new Boyer long stroke riveting hammer drives rivets up to 1 inch diameter 1¼ inch in frame. It is adapted to all kinds of riveting. It has a stroke of 9 inches, the estimated speed being 800 per minute. The Boyer hammers are intended for heavy clipping, light riveting, general calking and clipping, and for flue beading and light calking, and weigh from 8 to 13 pounds. The Chicago breast drill is adapted for light drilling, while the Boyer piston air drills will work up to 3 inches in iron or steel. Their reversible wood boring machine is adapted for all requirements. Their pneumatic stay bolt biter will cut bolts up to 1½ inches in diameter. We have also received from the same company a splendidly gotten up catalogue descriptive of their exhibit at the convention of the American Master Mechanics and Master Car Builders' Association at Saratoga Springs last June.

MANUFACTURING.

Iron and Steel.

The first annual meeting of the stockholders of the Susquehanna Iron & Steel Company was held August 7. The old Board of Directors, consisting of Charles A. Porter, John Q. Denney, H. F. Bruner, R. J. Houston, Dr. L. S. Filbert, J. W. Steacy, Percy M. Chandler, W. S. Kimball and John M. Mack, was unanimously re-elected.

The Claire Furnace, owned by M. A. Hanna, at Sharpsville, is out of blast to enable repairs to be made. The Shenango and Sharpsville furnaces are also being repaired. The only Sharpsville furnaces now in blast are the Mabel and the Alice. The Sharon plants of the National Steel Company are all in operation on full time.

The Aschman Steel Casting Company of Sharon, Pa., are erecting a new furnace.

The plant of the American Steel Hoop Company, at Greenville, Pa., is closed for repairs.

The Keystone Forging Company, Northumberland, Pa., have nearly doubled their capacity this year, and are now fairly busy with good prospects for fall trade.

The Northumberland Iron & Nail Works, Northumberland, Pa., report a decided improvement in the nail trade, which would indicate a movement from the deadness in the trade for the last two or three months.

The Keystone Tube Company of Newark, N. J., have been incorporated, with a capital stock of $80,000, to manufacture iron and steel, &c. The incorporators named are G. M. Keasbey, D. T. Howell and W. A. Calhoun.

The Mayville Furnace of the Northwestern Iron Company, Milwaukee, Wis., was blown out on August 2.

It is reported that the Chesapeake Nail Works, which closed down the last week of June, will resume operations about September 1. The dismantled machinery of the nail factory at Georgetown is being brought to Harrisburg, Pa., and will be installed at the Chesapeake Works. This will increase the capacity of the plant.

Puddlers and other employees of the Diamond State Steel Company at Wilmington, Del., dissatisfied with the cut of $1 a ton, which went into operation Tuesday, met Monday evening and decided not to work for decreased wages.

The Reeves Brothers' Company, Alliance, Ohio, have let contracts for the erection of a large addition to their plant, which is in process of construction.

Machinery.

The Chicago House Wrecking Company, Chicago, Ill., have just purchased the entire power plant of the Sioux City Traction Company, Sioux City, Iowa, consisting in part as follows: Two 13 x 22 x 13 Westinghouse compound engines, two Williams automatic engines, 17¾ x 24, four large boilers, two generators, pumps, shafting, &c. They have also bought the plant of the Dubuque Brass Works, Dubuque, Iowa, and have in consequence a complete brass plant for sale.

The Ridgway Dynamo & Engine Company, Ridgway, Pa., have recently been making additions to their machine tools, consisting of lathes, boring mills, large drill presses, &c. They are also making extensive changes on their testing blocks and installing a 500 horse-power surface condenser and a very complete system of steam and exhaust packing. The company believe that these improvements on their testing block will give them the most perfect testing outfit for both engines and generators to be found anywhere in the country. The above changes have been made as a result of the heavy increase in their business, which promises to exceed last year's by at least 100 per cent.

Carry & Vannan, Danville, Pa., are now building a 30-ton fly wheel in two halves for the Reading Iron Works, Reading, Pa. They are also making iron castings for shipment to South Africa.

The Richards Mfg. Company, Bloomsburg, Pa., are now, as they have been for 18 months, as busy as they can be manufacturing special machinery.

The E. Keeler Company, Williamsport, Pa., manufacturers of boilers, stacks and tanks, have enough orders in their boiler and sheet iron departments to run them at least three months. The capacity of their plant has been doubled within a year. They are about completing a contract with the United States Government for installing boilers at the Treasury Building, Washington, D. C.

The Berks Foundry & Machine Works, at Reading, Pa., which was partly destroyed by fire several months ago, has been repaired and has resumed operations in all departments.

At the recent annual stockholders' meeting of the Toledo Machine & Tool Company the following officers were elected: President, J. G. Robison; vice-president, E. P. Breckenridge; superintendent, H. J. Hinde; secretary and treasurer, Graff M. Acklin. The past year has been the best in the company's history.

The Union Malleable Iron Company announce their removal to East Moline, Ill., where they have just finished the construction and equipment of an entirely new and modern plant of 12,000 tons annual capacity. The buildings are all of brick, with steel roof construction. The foundry is 150 feet wide and 415 feet long, with three air furnaces and one cupola in separate annexes. The annealing room is 100 feet wide and 220 feet long. It contains eight large, gas heated ovens, and is equipped with an electric traveling crane having a span of 51 feet. They have two large Westinghouse electric alternating generators, driven by separate engines, aggregating 425 horse-power, which supply current for 45 arc and 500 incandescent lamps, in addition to 16 motors, varying in size from 2 to 50 horse-power, located in the different buildings for operating machinery. Their shipping facilities are excellent, as they have in their yards switch tracks, owned jointly by the C., B. & Q., C., R. I. & P. and C., M. & St. P. railways. The officers of the company are F. W. Gould, president and manager; Wm. Butterworth, vice-president; O. M. Stowe, secretary and treasurer, and C. C. Heald, superintendent.

The Remington Automobile & Motor Company have been incorporated under the laws of New Jersey, with a capital stock of $250,000, to manufacture and sell automobiles of every description, and to build and sell launches and small motor vessels, at Ilion, N. Y., where it is contemplated shortly to operate a large manufacturing establishment which at the outset will employ from 200 to 300 hands. The company own patents covering a new type of piston gasoline motor, designed and invented by Wm. A. Schmidt, who for a time and until recently was in charge of the experimental department of the Remington Arms Company. The motor is small and light, although it will be capable of producing very great horse-power and is almost noiseless in operation. The officers of the company are: President, Philo E. Remington; treasurer, S. C. Burch; secretary, P. A. Stubblebein.

At the annual meeting of the Western Automatic Machine Screw Company of Hartford, Conn., August 9 the following officers and directors were elected: President, George A. Fairfield; vice-president, Charles M. Beach; secretary and treasurer, S. H. Curtiss; corresponding secretary, M. H. Lavagood; directors, George A. Fairfield, Daniel Morrell, James U. Taintor, Leverett Brainard, Charles E. Gross, Charles M. Beach, George H. Day, T. Belknap Beach, Joseph K. Lanman.

W. H. Nicholson & Co., Wilkes-Barre, Pa., are adding new tools to their equipment, and report that demand for their patent expanding mandrels and compression shaft couplings continues good.

The Delahunty Dyeing Machine Company, Pittston, Pa., have built a new iron foundry, brass foundry, and machine and erecting shops. In addition to their regular line of building dyeing machinery, they are now doing general jobbing, foundry and machine work.

The Du Bois Iron Works, Du Bois, Pa., have recently had constructed an air compressor and also have equipped their shops with up to date air tools for carrying on the work they have now under construction. They are also adding some fine tools, such as grinding machines, lathes and cylinder boring machines to carry on the work of manufacturing the Lozier gas engines, for which they have large orders. They are under contract to supply several patterns of tubular boilers to large Pennsylvania coal mining companies.

The Kingsford Boiler Works, Oswego, N. Y., which were destroyed by fire several months ago, causing a loss of $100,000, are to be rebuilt. A much larger building, with increased accommodations and improved equipment, is contemplated.

The Kidder Press Company of Boston, Mass., announce that they have purchased the plant of the Somersworth Machine Company, and in connection with their other business shall be in position to do a considerable business for outside parties in gray iron castings.

The Providence Engineering Works, Providence, R. I., builders of the Rice & Sargent engine, have just completed a contract for two 750 horse-power engines for the New York Ship Building Company of Camden, N. J., and the engines have been installed in the power plant of the new ship yard of that company. The power plant consists of two 500 kw. mono-cyclic generators, which are directly connected to the engines in question. The engines are to run at a speed of 120 revolutions per minute, which is considered a necessity in the new feature of the almost exclusive use of electricity as a medium of power transmission.

The Meehan Boiler & Construction Company, Lowellville, Ohio, have been awarded contracts for the construction of 47 gas producers for the new steel plant of the Sharon Steel Company. The cost will be $40,000.

Hardware.

A. Prouty & Co., Ridgway, Pa., are having such a great increase in business that they have resolved to build a new factory with three times the capacity of their present plant. Their lines of manufacture are principally cant hooks and lumbermen's supplies. Most of their goods are covered by patents.

The Standard Axe & Tool Works, Ridgway, Pa., report a large run of orders, promising an increase of business this year of fully 50 per cent. over that of last.

The Demorest Mfg. Company, Williamsport, Pa., advise us that they have received orders in the last few days for 9500

sewing machines for export, in addition to regular domestic orders. They have also secured a standing order from one customer in South America for 300 machines a month.

American Safety Lamp & Mine Supply Company, Scranton, Pa., have worked to their full capacity thus far this year, manufacturing safety lamps and brewers' brass supplies. One order for 20,000 bung bushes was received from the United States Bung Mfg. Company, Brooklyn, N. Y.

Miscellaneous.

Vice-Chancellor Pitney of New Jersey has confirmed the sale by the receiver of the car works plant of the John Stephenson Company, at Elizabethport, N. J., which was sold for 226,000. The sale was attacked on the ground that it had not been properly advertised. It was alleged that the value of the plant was $800,000. The receiver proved that notice had been sent to all the creditors and that the sale had been extensively advertised in all the leading trade papers. The Vice-Chancellor approved the action of the receiver.

The Telser Mfg. Company of Waynesboro, Pa., are filling an order for traction engines for New Zealand.

At a recent meeting of the stockholders of the Consolidated Railway Electric Lighting & Equipment Company, held at the general offices of the company at 100 Broadway, New York, the following Board of Directors was elected: Walther Lüttgen, Norman Henderson, C. G. Kidder, George W. Knowlton, Thos. J. Ryan, Isaac L. Rice, Jno. N. Abbott, Aug. Treadwell, Jr. The vice-president and general manager of this company, Jno. N. Abbott, was formerly general passenger agent of the Erie Railroad and subsequently for several years chairman of the Western Passenger Association in Chicago. This company are a consolidation of the various companies heretofore engaged in the manufacture of electric lighting apparatus for all kinds of steam railway cars, the electricity being generated from the car axle while the car is in motion and furnished from a storage battery while the car is stationary. This system is known as the "Axle Light" system of electric lights and fans for railway coaches, and is in operation on various railway lines.

John H. Trimble & Bros. of Pittsburgh have been given a contract for the building of the Carnegie Library at Steubenville, Ohio, to cost $60,000. This amount was donated by Andrew Carnegie.

The Pittsburgh Coal Company of Pittsburgh will soon have the largest number of cars in the world, and more rolling stock than any other private corporation. Through the consolidation they will have 4000 freight cars and all these are to be painted and relettered, and the coal black color has been selected. The cars are being relettered to read "Pittsburgh Coal Company." They are mostly old style cars, and their capacity ranges from 20 tons to 35 tons.

The Pressed Steel Car Company of Pittsburgh have recently received large orders for steel cars and also for wooden cars with steel under framing. Orders have been received from the Chicago & Alton Railroad for steel hopper coal cars of the largest size, and also from the Union Pacific Railroad for cars of the same type, and a few days ago the company received an order for 500 steel cars from a Western road.

The Youngstown Steam Heating Company, organized at Youngstown, Ohio, are receiving the piping for the construction of their steam conveyance line through Youngstown. The pipes are of equal length, 6 feet long, 13 inches circumference inside and 22 inches outside. The inner lining is of tin, surrounded by 9 inches of pine and cedar wood casing. In constructing the line, the pipes are protected from decay and are guaranteed to wear 30 years.

In about a week's time the New England Electrolytic Company will close down their works in Central Falls, R. I., for an indefinite period. This fact was announced August 6 by the superintendent, A. E. Clark. The cause of the shut down, according to the same authority, is a lack of crude stock. It is thought by many, however, that the real cause is the fear of being driven out of the city by the municipal authorities, as in the case of the other copper company a few weeks ago. The plant is valued at $250,000 and employed nearly 200 hands. No new stock is being received at the works, and they will undoubtedly be closed as soon as that now on hand is used up.

A German firm have recently brought out a type of incandescent lamp which can be set in advance to burn a given number of hours and then automatically extinguish itself. In the base of the lamp is fixed a copper tube containing a central part of copper wire and filled with a solution of sulphate of copper. A current is arranged to pass through this solution from the wire to the tube, so that a continual electrolytic solution of the wire takes place. As soon as the wire is all dissolved the current is broken and the lamp goes out. The size and length of the wire may be set for any given number of hours and the lamp thus becomes automatic in its action.

The New York Shipbuilding Company of Camden, N. J., have taken their first contract for the building of a vessel.

British Trade for 1899.

The final official figures of British trade in 1899 make comparison with the two preceding years, as follows:

Imports.

	1899.	1898.	1897.
England and Wales..	£436,850,352	£423,615,670	£406,132,808
Scotland	36,923,923	36,224,982	34,419,686
Ireland	11,247,396	10,684,490	10,452,406
Isle of Man.....	13,912	19,560	24,060
Totals.....	£485,035,583	£470,544,702	£451,028,,960

Exports.

England and Wales..	£236,945,087	£209,489,393	£211,314,201
Scotland	27,212,339	23,643,143	22,617,611
Ireland	320,055	226,704	286,391
Isle of Man.....	14,730	.....	1,505
Totals.....	£264,492,011	£233,359,240	£234,219,708

It appears that the bulk of the increase in imports was received in England and Wales, the largest gain occurring at London, where the total value was £164,105,695, as compared with £155,669,956 in 1898. The other principal increases were at Cardiff, Manchester, Newhaven, Newport and Southampton. There was a falling off at Liverpool, Dover, Folkstone and Grimsby. Scotland had a fair proportion of the increase in exports, the bulk of the improvement being at Glasgow. In England and Wales the lead was taken by Liverpool, from which port the shipments were valued at £81,262,962, as compared with £74,866,495 in 1898, while the advance in value at London was from £49,125,872 to £53,717,477. Exports from Cardiff were about £3,000,000 higher in value than in 1898, and there were substantial gains at Grimsby, Manchester, Middlesbrough and the Tyne ports, and at Newport and Swansea.

To Develop Paraguay.—The Paraguay Development Company, with headquarters at 257 South Fourth street, Philadelphia, have been incorporated under the laws of New Jersey, with an authorized capital of $500,000. The objects as set forth in the certificate of incorporation are: To open up and develop the natural resources of South American countries, and especially of the Republic of Paraguay; to organize and conduct explorations; to engage in mining; to establish, lease or operate steamship lines; to promote immigration; to obtain and develop concessions of every kind; to provide for harbor works, docks, water works, railways, sewers and electric and other lighting plants; to receive and store merchandise and to conduct financial negotiations and operations for governments or individuals. The organization of this company is said to be largely due to the fact that the Government of Paraguay was officially represented by Señor Charles R. Santos at the recent International Congress in Philadelphia. Among the men behind this movement are claimed to be several large capitalists. Among the plans of the company are the lighting of Asuncion, the capital of Paraguay, and for building its trolley line. The proposed improvement of the harbor of Asuncion will be undertaken, as well as the construction of a railroad.

The six cities already counted by the Census Office show the following results, the returns for this year being placed beside those of 1890, with the percentage of increase:

Cities.	1900.	1890.	Percentage of Increase.
Washington	278,718	230,392	20.98
Cincinnati	325,902	296,908	9.77
Louisville	204,731	161,129	27.06
Milwaukee	285,315	204.486	39.54
Buffalo	352,219	255,664	37.77
Providence	175,597	132,146	32.88

A report from Cleveland, Ohio, says that J. C. Gilchrist, a vessel owner, and Robert L. Ireland, vice-president of the American Shipbuilding Company, have closed a deal for five large steel steamships, to have a carrying capacity of 5000 gross tons of ore, at a cost of about $225.000 each. The fleet is to be ready for service next spring. The boats will be of the same type as the steamer "Clarence," which was built at the yard of the Cleveland Shipbuilding Company, at Lorain, before the consolidation of the shipyards took place. She is one of the best boats on the lakes. About 10,000 tons of material will be used in their construction. Work on the vessels will be started as soon as the material is received. It has not been definitely settled at which of the yards of the American Shipbuilding Company the steamers will be built, but most of the work will be done at Cleveland and Lorain. The steamers will be among the fastest ships on the lakes.

The Iron and Metal Trades.

A more confident feeling is developing in the Iron trade, particularly in those branches in which prices have come down to figures as low as any reached in the years preceding the boom. This is particularly true of Bars, in which there has been a recoil from such figures as 85c. per 100 lbs. at mill, so that now 1c. to 1.10c. is being done on large contracts. A stronger feeling has also developed in Sheets. It is not claimed that in many other lines the advantage has yet turned to the buyer's side, but it is certain that more interest is being taken in the market.

It is difficult to escape the impression that consumption is really greater than would appear on the surface, and quite a tonnage of new orders holds out a good promise for the future. In Pig Iron there has been a little more activity, although prices are still sagging. Southern interests report some good export sales, among them one lot of 15,000 tons, while Eastern Malleable works have purchased about 8000 tons, of which 5000 tons was off Bessemer. In Steel there are reports of recent purchases of Basic Open Hearth, for Pipe purposes, amounting to about 17,000 tons, at a close figure. As a matter of fact there is rather more pressure to sell Basic Open Hearth Steel than Bessemer Steel, and somewhat more inquiry for it from Europe. Among the recent export sales we note one lot of 3000 tons of Basic Open Hearth Steel for the east coast of Great Britain.

In Structural Material quite a good deal has been done lately. We note quite a number of contracts for buildings and bridges, aggregating about 10,000 tons, including one 1000-ton lot for South America. The large contract for the new East River Bridge, involving about 18,000 tons, has not yet been placed. From the lakes comes the report of the placing of an order for five boats, which will call for about 10,000 tons of material, and some shipbuilding material is also coming up on the Delaware.

The question of freight room for export shipments continues a troublesome matter, and the tendency is still upward. Still, aside from the Pig Iron and Billet sales alluded to, some business has been done in Finished Steel, including one lot of 800 tons of Hoops for Scotland.

The Steel Rail trade is lifeless, and some of the mills have closed down because they have exhausted the orders on their books. It is yet too early to take up the question of next year's work, and until that period arrives we may see a continuance of a nominal price out of all proportion to the current values of similar Steel products.

Conferences are now going on at Detroit between employers and employees in the Tin Plate industry. In other departments of the Western Finished Iron trade adjustments with the Amalgamated Association are still pending, but the demands of the men are such that there is some danger of a disagreement. There are, however, so many non-union mills in the Pittsburgh district and elsewhere that in any case only a partial stoppage is likely.

Prices of Structural Shapes have been reduced $8 per ton.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

	Aug. 15, 1900.	Aug. 8, 1900.	July 19, 1900.	Aug. 16, 1899.
PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	**$16.25**	$16.25	$15.50	$20.50
Foundry Pig, No. 2, Southern, Cincinnati	*13.75*	14.50	16.50	18.25
Foundry Pig, No. 2, Local, Chicago	*16.00*	16.00	18.00	20.50
Bessemer Pig, Pittsburgh	*16.00*	16.00	17.00	21.25
Gray Forge, Pittsburgh	*14.00*	14.00	15.50	18.50
Lake Superior Charcoal, Chicago	*20.00*	20.00	22.00	23.00
BILLETS, RAILS, ETC.:				
Steel Billets, Pittsburgh	*18.00*	18.00	20.00	35.50
Steel Billets, Philadelphia	*20.50*	20.50	22.50	36.00
Steel Billets, Chicago	20.00	20.00	....	36.80
Wire Rods, Pittsburgh	35.00	35.00	35.00	44.00
Steel Rails, Heavy, Eastern Mill	35.00	35.00	35.00	31.00
Spikes, Tidewater	*1.80*	2.00	2.15	2.25
Splice Bars, Tidewater	*1.50*	2.00	2.00	1.95
OLD MATERIAL:				
O. Steel Rails, Chicago	9.50	9.50	9.50	15.00
O. Steel Rails, Philadelphia	13.00	13.00	13.00	17.50
O. Iron Rails, Chicago	12.50	12.50	12.50	21.00
O. Iron Rails, Philadelphia	*14.00*	14.00	15.00	21.50
O. Car Wheels, Chicago	*15.00*	15.00	18.00	15.50
O. Car Wheels, Philadelphia	17.00	17.00	17.00	17.25
Heavy Steel Scrap, Chicago	9.00	9.00	9.00	14.00
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.30	1.25	1.30	2.00
Common Iron Bars, Youngstown	*1.25*	1.25	1.35	1.90
Steel Bars, Tidewater	*1 17½*	1.15	1.40	2.20
Steel Bars, Pittsburgh	*1.1'*	1.10	1.15	2.10
Tank Plates, Tidewater	1.30	1.30	1.30	2.70
Tank Plates, Pittsburgh	*1.10*	1.10	1.15	2.50
Beams, Tidewater	2.05	2.05	2.05	2.15
Beams, Pittsburgh	1.90	1.90	1.90	2.00
Angles, Tidewater	1.95	1.95	1.95	2.15
Angles, Pittsburgh	1.80	1.80	1.80	2.00
Skelp, Grooved Iron, Pittsburgh	1.25	1.25	1.25	2.25
Skelp, Sheared Iron, Pittsburgh	1.25	1.25	1.25	2.60
Sheets, No. 27, Chicago	*3.05*	3.05	3.10	3.18
Sheets, No. 27, Pittsburgh	*2.85*	2.85	2.90	3.05
Barb Wire, f.o.b. Pittsburgh	2.80	2.80	2.80	3.10
Wire Nails, f.o.b. Pittsburgh	2.20	2.20	2.20	2.50
Cut Nails, Mill	1.95	1.95	1.95	2.20
METALS:				
Copper, New York	**16.50**	16.50	16.37½	18.50
Spelter, St. Louis	4.00	4.00	4.00	5.62½
Lead, New York	**4.25**	4.25	4.00	4.57½
Lead, St. Louis	**4.20**	4.20	3.95	4.57½
Tin, New York	*31.50*	31.65	34.00	31.00
Antimony, Hallett, New York	*9.50*	9.50	9.62½	9.75
Nickel, New York	55.00	55.00	55.00	36.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.84	4.84	4.84	4.55

Chicago. (*By Telegraph.*)

Office of *The Iron Age*, 1205 Fisher Building,
CHICAGO, August 15, 1900.

Inquiry has grown this week to very respectable proportions. It has extended to many branches of Iron and Steel manufacture, and is now the rule rather than the exception. And the inquiries have been followed by buying. The situation, on the whole, has greatly improved. There continues a moderate degree of activity in Bars, but most large interests are believed to have closed for their requirements. Consumers of Merchant Steel have been buying freely, while boiler makers have at last concluded that the acceptable moment has arrived and are placing orders without apparent misgivings that values will further decline. The good effects of this activity are shown in a gradual stiffening of prices. As noted a week ago, Bars are stronger in tone and in price. This week they have made further progress in that direction. Makers of Merchant Steel have withdrawn some low quotations previously issued to the trade. The tendency of Sheets is to recover from the weakness into which they had fallen. These conditions exist in the midst of the usual midsummer lull and are regarded as very encouraging features.

Pig Iron.—The opinion prevails that within 30 days, possibly very much within that period, there may be a lively buying movement in Pig Iron. Large consumers are quoted as saying that prices are probably about as low as they will go in the near future. They are accordingly getting ready to buy. Inquiries this week are decidedly better than for any similar period for many months. One consumer at Massillon, Ohio, is asking prices for 10,000 tons for deliveries extending almost through a year. And inquiries ranging from 2000 to 500 tons were quite common this week. A favorite term of life for the shipments is three to four months, with variations on either side. The sales of Iron for quick shipment also show notable increase. The Malleable interests are beginning to inquire, but that branch of the trade is scarcely active as yet. It is reported that the Spring Valley, Wis., Furnace and the Calumet Furnace at Chicago will close down as soon as they complete some lingering orders on hand, probably within two

weeks. Prices are much the same as a week ago. Quotations below have been shaded on desirable lots, and, while the market seems to be hardening, a certain amount of irregularity continues. Quotations are as follows:

Lake Superior Charcoal	$20.00 to $21.00
Local Coke Foundry, No. 1	17.00 to 17.50
Local Coke Foundry, No. 2	16.00 to 16.50
Local Coke Foundry, No. 3	15.50 to 16.00
Local Scotch, No. 1	17.00 to 17.50
Ohio Strong Softeners, No. 1	18.50 to 19.00
Southern Silvery, according to Silicon	18.35 to 19.35
Southern Coke, No. 1	16.85 to 17.85
Southern Coke, No. 2	15.85 to 16.35
Southern Coke, No. 3	15.35 to 16.35
Southern Coke, No. 1 Soft	16.85 to 17.85
Southern Coke, No. 2 Soft	15.85 to 16.35
Foundry Forge	14.85 to 15.85
Gray Forge and Mottled	14.35 to 14.85
Southern Charcoal Softeners, according to Silicon	18.35 to 19.35
Alabama and Georgia Car Wheel	21.85 to 22.85
Malleable Bessemer	18.00 to 19.00
Standard Bessemer	19.00 to 20.00
Jackson County and Kentucky Silvery, 8 per cent. Silicon	20.00 to 21.00

Bars.—Some consumers of Bars are trying in vain to secure the repetition of quotations made several weeks ago. They delayed too long, for the makers quoting have withdrawn prices, substituting others from $2 to $4 higher. This withdrawal has not been unanimous nor uniform. Each maker took action as his order books suggested. The representative of one of these makers remarks: "We can now go along without the aid of any one." Not only have the prices of Bars advanced, but of related products also. Steel Bars are still quoted by some makers at 1.25c., Chicago, but other producers are quoting 1.30c. to 1.35c. The store price of Steel Bars is 1.50c. to 1.75c., and of Iron Bars from 1.60c. to 1.75c.; Hoops, 1.90c. to 2c. Iron Bars are especially firm, owing to the general idleness of mills. One small maker at Chicago is running, but the great majority of the independent producers are idle, pending the wage settlement or awaiting an advance of prices.

Structural Material.—Business aggregates a moderate tonnage, mainly for early wants. The local strike in the building trades has some fresh indications of an early end, but building operations in the city are quite restricted. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 2.05c.; 18 inches and over, 2.15c.; Angles, 3 inches and over, 1.95c.; Angles under 3 inches, 1.30c.; Tees, 2.10c.; Universal Plates, 1.30c. From local yards small lots of Beams and Channels are quoted 2.55c. to 2.75c.; Angles, 2.20c. to 2.30c. rates, and Tees, 2.40c. to 2.60c.

Plates.—Trade in Plates lacks unusually large orders, but the many small sales make a volume quite large. Transactions are now closed with less negotiation and less delay than for many months, consumers having evidently reached the conclusion that purchases are desirable. Some of the transactions indicate a speculative tendency on the part of buyers. Tank Plates are quoted at 1.30c. to 1.35c., from mill, and Flange, 1.65c. to 1.75c. From store Tank is quoted at 1.65c. to 1.75c., and Flange, 1.90c. to 2c.

Merchant Pipe.—A week ago orders were unusually brisk. Trade has since subsided in a measure, but remains fairly good. Quotations have been revised as follows:

	In carloads. Blk.	In carloads. Galvd.	Less than carloads. Blk.	Less than carloads. Galvd.
⅛ to ½ inch and 11 to 12 inches	61.2	48.7	57.4	43.4
¾ to 10 inches	68.7	56.2	63.9	51.4

Sheets.—The level of prices in Sheets from store continues below the natural range, based upon selling price from mill. The explanation is the continuance in the market of remnants from stocks bought at low prices many months ago. There is a brisk demand both from mill and store. In small lots Common, No. 27, can still be picked up at about 2.10c. to 2.20c., and Galvanized is unchanged at 70 and 10 to 70 and 12½ per cent.

Merchant Steel.—The market has been altogether lively during the past week. Wagon makers have been buying Tire Steel in goodly lots, and for various other shapes the demand is excellent. Prices are not quotably higher, but some extremely low figures issued not long ago have been withdrawn and the market is firmer in tone. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Tire, 1.80c. to 2c.; Open Hearth Spring Steel, 2.25c. to 2.50c.; Toe Calk, 2.50c. to 2.75c.; Sleigh Shoe, 1.75c. to 2c.; Cutter Shoes, 2.50c. to 2.75c.; Ordinary Tool Steel, 7c. to 7½c.; Special, 13c. and upward.

Rails and Track Supplies.—Light Rails are moving in fairly good sized lots and mills continue busy. Quotations are as follows: Rails are $35 to $37 for Standard Sections, and $29 to $33 for Light Rails. Splice Bars, 1.50c. to 1.60c. Spikes are quoted 1.80c. to 1.90c.; Bolts, with Hexagon Nuts, 2.40c. to 2.50c.; Square Nuts, 2.30c. to 2.40c.

Old Material.—The trade is still waiting for the resumption of activities in consumption and offerings are small. Cast Scrap is one exception to the general dullness and is moving in fairly good quantities at current quotations. For Relaying Rails inquiry is good and there have been a number of Western transactions, with the effect of giving an upward turn to values. The following are approximate quotations per gross ton:

Old Iron Rails	$12.50 to $13.00
Old Steel Rails, mixed lengths	9.50 to 10.00
Old Steel Rails, long lengths	10.50 to 11.00
Relaying Rails	22.00 to 23.00
Old Car Wheels	15.00 to 15.50
Heavy Melting Steel Scrap	9.00 to 10.00
Mixed Steel	8.00 to 9.00
Iron Fish Plates	11.50 to 12.00
Steel or mixed do	10.00 to 11.00
Iron Car Axles	15.00 to 15.50
Steel Car Axles	14.00 to 14.50
No. 1 Railroad Wrought	11.50 to 12.00
No. 2 Railroad Wrought	10.00 to 10.50
Shafting, Iron and Soft Steel	15.00 to 16.00
No. 1 Wrought	9.00 to 9.50
No. 1 Country Wrought	8.00 to 8.50
No. 1 Mill	7.00 to 7.50
No. 2 Mill	5.50 to 6.00
No. 1 Busheling	8.00 to 8.50
No. 2 Busheling	7.00 to 7.50
Iron Car Axle Turnings	8.00 to 8.50
Soft Steel Axle Turnings	7.00 to 8.00
Machine Shop Turnings	6.50 to 7.00
Wrought Drillings	6.00 to 6.50
Cast Borings	4.00 to 4.50
Mixed Borings and Turnings	4.00 to 5.00
No. 1 Boilers, cut	8.50 to 9.00
No. 2 Boilers, cut	6.00 to 6.50
Boiler and Ship Scrap	8.00 to 8.50
No. 1 Cast	10.00 to 11.00
No. 2 Cast	7.00 to 8.00
Railroad Malleable Cast	10.00 to 10.50
Agricultural Malleable Cast	9.00 to 9.50

Metals.—The Metal market is firm, but without special activity. Lake Copper is quoted at 17c. and Casting at 16¾c. Lead is unchanged and quiet at 4.20c. for Desilverized and 4.30c. for Corroding.

The American Steel Hoop Company have reopened an office at 1121 Marquette Building, Chicago, with W. A. Kingsley in charge as district sales agent.

The Champion Iron & Steel Company, Muskegon, Mich., who last week began dipping Tin Plates, are this week running the six mills completed and are now turning out from 600 to 700 boxes of Plates daily. Two additional mills will be ready for operation within 60 days.

Philadelphia.

Office of *The Iron Age*, Forrest Building, Philadelphia, Pa., August 14, 1900.

The tone of the market is very much better than it has been for months past. This in a measure is due to improved conditions, but is further enhanced by the perceptible diminishment of stocks. Not only is there less material in the hands of consumers, but there is a heavy decrease in production, which may be severely felt a little later on. So far there is no rush to place orders in anticipation of any such contingency, although a great deal of business was done last week, and a great many inquiries are being made for additional quantities this week, but whether they will all go through or not will depend upon developments in the immediate future. It is a very distinct change, however, to note that the attention of the trade is now centered on the question of higher prices, rather than lower. In other words, it is recognized that for the present there can be no decline from the rates recently ruling, but the possibility of a higher range is again being seriously considered. The demand is assuming large proportions, and as the supply is being heavily curtailed the chances of more or less of a scarcity cannot be ignored. Buying is very conservative, however, but sellers have recovered their grip and are again turning down business if prices are not just what suits them, and that in most cases is a slight advance on recent transactions.

Pig Iron.—The feeling is stronger than it was a week ago, but it cannot be claimed that prices are higher. The severe cutting down in production has had a stiffening influence, however, so that bids at a decline from last week's figures receive no consideration at all. In most cases sellers ask slight advances, and while the average of sales would no doubt make a favorable exhibit, the actual change is not important. Still the tendency is clearly in sellers' favor, and buyers have to pay the price or leave the Iron. Conditions are such, however, that it is almost impossible to gauge the market with exactness, so that buyers and sellers alike are moving very cautiously, the former on the ground that prices ought to be high enough at their present level, while sellers have reasonable

warrant for expecting that all the Iron that is now being made can be readily marketed at present prices or better. Sales during the week have been on a larger scale than usual, with prices averaging from $16.25 to $16.75 for No. 2 X Foundry, and for special brands still more money is paid. The range of prices is about as follows for city or nearby deliveries: No. 1 X Foundry, $17 to $18; No. 2 X Foundry, $16.25 to $17; No. 2 Plain, $15.75 to $16; Mill Irons, $14.50 to $15; Ordinary, $14 to $14.50; Basic, $15 to $15.50; Bessemer, $15.50 to $16; Low Phosphorus, $24 to $25.

Billets.—There is nothing doing of any importance. Sellers are asking a little more money, in some cases $21.50 to $22, but it is claimed that business could be done at $1 less if the right kind of bids were made.

Plates.—There is not very much change in this line, although there is a fair demand and somewhat firmer prices. Mills have taken in a good assortment of orders during the past two or three weeks, and have calls for about as much as they can turn out. The hot weather has been unfavorable for a large product, however, and as the capacity in operation is very large, it will require a heavy stream of orders to keep the mills fully employed as soon as normal conditions prevail. Prices firm as follows for the general run of orders: Plates, ¼-inch and thicker, 1.30c. to 1.35c.; Universals, 1.35c. to 1.40c.; Shell, 1.50c. to 1.55c.; Flange, 1.60c. to 1.65c.; Charcoal Iron Plates, C. H. No. 1, 2.40c.; Best Flange, 2.90c.; Fire Box, 3.40c.

Structural Material.—Quite a good deal of business has been placed during the past week, chiefly for bridge work. There is nothing large in individual orders, but the aggregate tonnage fills up very nicely, so that steady employment is regarded as certain during the fall months. Some of the mills are crowded, but by shopping around buyers can get what they require within reasonable time for delivery. July was a dull month, but so far August is furnishing a very satisfactory amount of new business. Prices remain as follows for seaboard and nearby points: Beams and Channels, 15-inch and under, 2.03c.; Angles, 3 to 6 inches, 1.93c.

Bars.—The feeling is stronger in Bars. The continued suspension of work in the West and a partial suspension in the East is causing quite a shortage in Iron Bars, and if it had not been for the heavy drop in Steel Bars prices of Iron Bars would probably be materially higher than they are at present. Sellers are asking more money, however, and 1.30c. to 1.35c. is as well as could be done for Refined Iron, and 1.17½c. to 1.25c. for Steel Bars. Mills are taking in a great many orders, and manufacturers claim to be expecting further advances in the near future.

Sheets.—There is a good demand, and mills have about as many orders as they can handle, considering the extreme heat and other drawbacks. Prices are as follows for Best Sheets (Common Sheets two-tenths less): No. 10, 2.30c.; No. 14, 2.40c.; No. 16, 2.50c.; Nos. 18-20, 3c.; Nos. 21-24, 3.10c.; Nos. 26, 27, 3.20c.; No. 28, 3.30c.

Old Material.—The demand has been a little better, but owing to the hot weather, labor differences and other influences bids are not as freely made as they were a week or ten days ago. Bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, $14 to $14.50; No. 1 Yard Scrap, $11 to $12; No. 2 Light Scrap, $10.50 to $11; Machinery Cast, $13.50 to $14.50; Heavy Steel Scrap, $10.50 to $11.50; Old Iron Rails, $14 to $15; Old Steel Rails, $13 to $14; Wrought Turnings, $8 to $8.50; Cast Borings, $6.50 to $7; Old Car Wheels, $17 to $18; Iron Axles, $15 to $16; Steel Axles, $16 to $17.

Cleveland.

CLEVELAND, OHIO, August 14, 1900.

Iron Ore.—*Lake Freights.*—Shippers of Iron Ore are now in absolute control of the lake freights on the transportation of their commodity. They appear to be able to make reductions at will, but have no organization nor agreement, according to the dictates of which they act. An instance indicative of the conditions was cited this week. One shipper had a block of 25,000 tons of Iron Ore to move down the lakes. This is about three good sized cargoes and is to be delivered to the carrier through the next few months. Without much quibbling over the rates the contract to move the stuff was taken at 75c. The cargoes are to be furnished at Duluth and to be delivered at Ohio ports, Ashtabula and Cleveland being specified. The weakness of the market is indicated in this, that there were other boats willing to make similar contracts or take wild stuff at that contract rate, but could not get it to move. No sales have been made this week of any kind of Ore. There is little or no demand for Ore, because most of the year's supply was contracted for ahead. Some of the furnaces did not supply their needs entirely, but they find now that the demand for Pig Iron is not going to compel them to buy extensively of Ore.

Pig Iron.—Conditions are but slightly changed from what they were a week ago. If anything there is a slightly increased demand for Foundry Irons, both for immediate shipment and for future delivery. This applies more to orders for the future than for the present. The foundries in this territory which make machine castings are still tied up by the strike and there is but little hope of its being settled at once, although the molders are showing some disposition to yield. The foundrymen are not anxious to settle, because there is no immediate need of their opening their foundries. In the Gray Iron foundries the work is picking up some, hence there is a slightly increased demand for Iron. In general the foundries are getting a line on the market of the future and are making ready to meet the demands that are made of them. This is occasioning a slight increase in the inquiries for Iron for future delivery. The prices made by the furnacemen vary greatly, but $16 and $16.50, Cleveland, ought to be about the market for Nos. 1 and 2.

Finished Materials.—In general it might be said that the market is more brisk than it has been, all grades looking up. In the instances where a price was weak a week ago it is now stronger and better conditions prevail. Heavy sales are still being made and some are expected. The scene of the greatest activity has been in Agricultural Steel, but it seems now likely to shift to Plates, on which there appears to be a big demand. The sales in agricultural material have not subsided, however, for large contracts are still being made.

Plates.—There is a diversity in the quotation on Plates. The market seems to be about 1.20c. to 1.25c., Cleveland, but some concerns are demanding the Cleveland figure at Pittsburgh, therefore putting the Cleveland price to 1.30c. and 1.35c. The market is stronger than it has been because of inquiries for big contracts. Buyers are about to supply themselves with material for ships to be built during the winter, these to be launched in time for the opening of the season of navigation next year. It is expected that in the next few weeks some large orders of this kind will be placed.

Bars.—The price of Bars varies also. Big contracts have been taken on this class at 1c., but the market quotation appears to be about 1.10c. to 1.15c., Cleveland. Sales have been rather heavy this week at the lower prices, and the prospects are good for more business in the immediate future.

Angles.—There is now but one quotation on the market and the probabilities of a break in the price have been reduced to the minimum. The mills outside of the association have been quoting prices on Angles, 3 inches and over, at about $3 to $5 a ton lower than the association mills had agreed upon. One of the largest mills outside of the association this week agreed to maintain the association prices, and the others have joined. All of the mills therefore now are quoting the association agreed price of 1.80c. on Angles of 3 inches and over. The price on smaller sized Angles varies, as there has been no agreement concerning them.

Old Iron.—The market is slightly better for Old Iron than it has been of late. Business in all grades is moving a little more freely than it has been, but being light as yet. There is a considerable demand for Machinery Cast Scrap, which is bringing $12, Cleveland. Next in demand is Stove Scrap, which is quoted at $7. Other grades are moving, but there is hardly enough business to make a quotation possible.

The report reached this city last night from Duluth that John D. Rockefeller had transferred his holdings in the Stephens mines to the Carnegie Steel Company. The provision is made in the papers making the transfer that the boats of the Bessemer Steamship Company, of which Mr. Rockefeller is the head, shall transport the Ore to the Ohio ports at a 50c. freight, the owner of the Ore to pay the loading and unloading charges. This is taken as indicative of an agreement between the two interests touching the movement of Ore. By it Mr. Rockefeller retires as a producer, and Mr. Carnegie is supposed to have agreed to withdraw from the lakes as an owner of tonnage. The report has it that the vessels of the Pittsburgh Steamship Company, of which Mr. Carnegie is the head, are to pass into the hands of Mr. Rockefeller. This part of the story is not substantiated. The report further has it that the dock property along both Lake Superior and Lake Erie, owned by Mr. Rockefeller, is to pass into the hands of Mr. Carnegie.

St. Louis. (*By Telegraph.*)

Office of *The Iron Age*, 1205 Chemical Building, St. Louis, August 15, 1900.

Pig Iron.—There is no marked change in the Pig Iron situation; as compared with business a year ago, there is practically nothing doing. Some interests say that they have had a few orders the past week for 50 and even 200 tons, but that carload wants predominate. There is no concealing the fact that foundry yards are in a barren condition. Rather than buy new Iron, Scrap is being melted, in some instances with just enough Softener to get requirements. Inquiry, however, is said to be freer and correspondents write as though they meant business. It is said that they believe costs differ from those of last year and that present prices represent costs, if not below that now. Considering the limited number of transactions, there is difficulty had in establishing a price. Quotations below show a shrinking of 50c., but, as mentioned last week, they are not made by all in interest. We quote, f.o.b. cars St. Louis:

Southern, No. 1 Foundry	$16.25 to $16.50
Southern, No. 2 Foundry	15.25 to 15.50
Southern, No. 3 Foundry	14.25 to 14.50
No. 1 Soft	16.25 to 16.50
No. 2 Soft	15.25 to 15.50
Gray Forge	13.25 to 13.50

Bars.—It seems the sentiment of the trade that the turning point in prices has been reached. A large tonnage has been entered up by mills at the low prices of the past few weeks, and the understanding is that no more business is wanted at these figures. It is said that if demand continues to increase higher prices may be looked for in the near future. As very few of the mills are running some difficulty is experienced in getting stock of leading sizes. There is a stiffening in values and some mills quote $1 advance on prices below. For desirable tonnage only mills quote Steel Bars at 1.30c. and Iron 1.40c., base, half extras. Jobbers quote 1.75c. for Iron and 1.90c., base, for Steel, full extras.

Rails and Track Supplies.—There is quite a good demand for Track Supplies. Indications from plans now contemplated are that there will be some excellent business for next year. We quote Splice Bars, 1.80c.; Track Bolts, with Square Nuts, 2.50c.; with Hexagon Nuts, 2.70c.; Spikes, 1.80c.; Links and Pins, 2c.

Pig Lead.—Desilverized is stationary at 4.20c. and Soft Missouri 4.15c. Buying is going on in a very limited way. It is claimed that uncertainty as to prices dictates the hand to mouth buying. Lead Ore unchanged at $47 per ton.

Spelter.—Interest is slightly increasing; more inquiry has been had than in recent weeks. Latest known sale was of 100 tons at 4c., for September delivery. Zinc Ore is firm at $28 per ton.

Cincinnati. (*By Telegraph.*)

Office of *The Iron Age*, Fifth and Main streets, Cincinnati, August 15, 1900.

The Pig Iron market has been decidedly brisker in a retail way. The number of buyers who lodged orders for one to three carload lots was much larger than for many weeks past. A fair number of inquiries for large lots are also coming in, but these do not seem to bring any business, but are rather for the purpose of feeling the market. Sellers show much less composure than buyers and the odds of the situation seem strongly in favor of the latter. The urgency on the part of a number of furnaces to sell continues to throw prices down, and so far is not producing anything beyond distrust among buyers, many of whom have very radical ideas on the "bear" side of the market. Inquirers are met with the proposition, "Our price is so much, what will you give?" A feeling of disappointment pervades the ranks of sellers and conjectures as to the market's course are not so freely made as they have been. Freight rate from Birmingham is $3.25 to this point; from the Hanging Rock district $1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	$14.75 to $15.00
Southern Coke, No. 2	13.75 to 14.00
Southern Coke, No. 3	13.00 to 13.25
Southern Coke, No. 4	12.00 to 12.50
Southern Coke, No. 1 Soft	14.75 to 15.00
Southern Coke, No. 2 Soft	13.75 to 14.00
Southern Coke, Gray Forge	12.00 to 12.50
Southern Coke, Mottled	12.00 to 12.50
Ohio Silvery, No. 1	18.50 to 19.00
Ohio Silvery, No. 2	17.50 to 18.00
Lake Superior Coke, No. 1	.... to 15.00
Lake Superior Coke, No. 2	.... to 14.00
Lake Superior Coke, No. 3	.... to 13.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, Chilling grades	$22.50 to $23.25
Standard Southern Car Wheel, No. 2	21.50 to 22.00
Lake Superior Car Wheel and Malleable	20.00 to 21.50

Plates and Bars.—The market has been quiet, though with an undertone of firmness and quotations nominally unchanged. We quote, f.o.b. Cincinnati: Iron Bars, carload lots, 1.60c., with half extras; in small lots, 2c., with full extras; Bar Steel, carload lots, 1.70c., with half extras; small lots, 2c., with full extras; Iron Bar Angles, 1½ x 3-16 inch and larger, in car lots, 1.75c.; small, 2.25c.; Sheets, No. 10, 2.25c.; No. 27, Steel, 3c.; Plates, 2c. to 2.25c.

Old Material.—Business has been very slack and prices rather uncertain, though nominally unchanged. We quote dealers' buying prices per gross ton, f.o.b. Cincinnati, as follows: No. 1 Wrought Railroad Scrap, $11 to $12; Cast Railroad and Machine Scrap, $10 to $11; Iron Axles, $14 to $15; Iron Rails, $12 to $13; Car Wheels, $14 to $15.

The Peninsular Iron Company of Detroit, Mich., producers of Lake Superior Charcoal Pig Iron, have made an arrangement with Rogers, Brown & Co. for the sale of their product in all markets.

Rogers, Brown & Co. have been appointed sole selling agents for the product of the Allegheny Furnace, located at Iron Gate, Va. The furnace is out for repairs, but is expected to blow in on October 1. There is Iron on hand to keep the trade supplied in the meantime.

Birmingham.

Birmingham, Ala., August 13, 1900.

One must be all eyes and all ears and quick at conclusions concerning the market, for it is in a state of transition. There can be no doubt that there is a better feeling in the market. Inquiries are very materially increased, and transactions are more frequent and of greater magnitude. There is no fixed price on any grade. Every seller is governed by circumstances as they appear from his standpoint. All sorts of prices were bid for Iron. One buyer evidently thought there was no bottom to prices, as he offered $9.50 for 10,000 tons of No. 3 Foundry, terms cash. The interest receiving the offer had already sold No. 3 Foundry at $11.47. There were sales of Gray Forge at $10.27, and one bid for 6000 tons of Gray Forge at $10.25, as also for one lot of 20,000 tons. Both of these were turned down, and $10.50 was asked. Local buyers have been testing the market very thoroughly, but none have been able to secure any Iron on a basis below $12 to $12.20 for No. 2 Foundry; and at this quotation they are moderately supplying their wants. It is a curious fact that purchases by the export trade exceed those of the domestic trade, and the price paid is in excess of the majority of the bids by domestic sources, and this, too, in the face of a material advance in freight. As an example of this increase in freight rate, take one European port to which the rate is now $5.14. It was $3.75. The advance is over 40 per cent. But cotton carriers will soon be heading for our Southern ports and give the situation an easement. The sales for export and the prices obtained were communicated to your correspondent, but for obvious reasons they are withheld from publication. He can only say they are of sufficient magnitude to indicate that there are aching voids to fill among the European buyers, and the prices paid are full present market values.

The Steel mill is again at work, and the Bar and Rod mill are employing at the present time over 500 men. The Dimmick Pipe Works have their foundry, machine and pattern shops in full blast, but are not yet making Pipe. Barring acident, they will be at it some time this week.

All the contract shops the past week have had to deal with a strike on the part of the blacksmiths and machinists. Their wages were $3 per day, and they determined that they should be $3.25 per day or they would walk out. With prompt unanimity the shops affected discharged and paid off the strikers, declining to consider their demands. The number of men affected is probably 150, and they are out jobs at $3 per day, while the same class of labor at Cincinnati are perfectly satisfied to work for $2.25 per day. No one outside the ranks of the strikers has any sympathy with the movement. Precipitated at a time when Iron industries were depressed and profits were being pared to shavings, it was an indiscreet and ill advised movement, and must react to the injury of those only who are engaged in it. The shops will be temporarily inconvenienced, but in a short time the strikers' places will be filled.

The Republic Iron & Steel Company are opening their brown Ore mines at Goethite, where they have erected one of the improved Stewart washers, which have given such good results throughout the district wherever they have been tried. At Warren they have driven a slope in one mine 115 feet, and find a continuous 5-foot vein. At their Sayreton mine, which has produced good results,

they have placed another washer, and are pushing as fast as possible to completion the 500 Coke ovens they are erecting. When their plans are completed they will be able to live at home, for they will own and control and themselves handle all the material that goes to the making of Iron. Another new Coal mine is being opened by this company between Warren and Sayreton on the Pratt Seam. Connections are now being made with the Southern Railroad. This will be their last link in the chain of connection for supplies.

If the bank clearings are any indication of the condition of business we ought to be well satisfied, for they show an increase of 48 per cent. the first six months of the year over the corresponding time last year.

The Southern Nut & Bolt Works, which were closed down about two years ago, have been leased by W. H. Merritt, who will open the shop and start up as soon as possible.

The report, recently made, of the Southern Iron Association shows that the shipments in July from Alabama and Tennessee were 67,632 tons. Of this amount there went from the Birmingham district 38,390 tons; and 10,700 tons of this amount went for export. This shows how dull was business. Last year the July shipments from Alabama and Tennessee were 137,782 tons, of which 82,914 tons went from the Birmingham district. Of this amount 15,424 tons went for export.

The demand for Coal continues good for the season, and the price for standard run of the mine is $1.20 to $1.25 per ton. The winter price is 5c. higher.

The British Iron Market.

Summary.—The business doing in Pig Iron is still restricted, and there is a noticeable disinclination on the part of buyers to operate for more than immediate requirements. At the same time the general tone of the market is by no means unsatisfactory and more confidence in the future is felt. The recent hot weather impeded work in all branches of the trade, and the output was reduced to a corresponding extent, strengthening the position of makers in some degree. Business in manufactured Iron and Steel shows some little improvement, many consumers who had deferred placing their orders till the last moment having come into the market. In the engineering trades activity is maintained in most branches, but makers of textile machinery report some slackening. In regard to shipbuilding, the returns for last month show an improvement in the number of orders given out, but new work is still scarce. The American market is irregular, but there is more business. French and Belgian advices report a continuance of the recent lull, and in Germany a slower tendency is noticeable.

Pig Iron.—Only a small business is doing in Pig Iron at present, but the outlook is considered decidedly favorable, and makers expect an improvement in prices in the autumn. The production appears to be limited all round, and although prices of some brands have a lower tendency, others have advanced. No. 3 Cleveland, for instance, of which the output has been very small this week, has been put up to 69 shillings 6 pence, although the lower qualities have been cheaper, and Carron Iron is 1 shilling dearer. Although there is apparently no probability of prices going lower, consumers still hesitate to buy for forward delivery and confine their purchases to immediate wants. The greater part of the production in most districts, however, is passing into consumption, being only about equal to current requirements. Warrants have been rising. Cleveland have been above makers' Iron on account of their sarcity, and in Glasgow, although the market has been very idle, prices have been steadily going up, Scotch being now quoted at 72 shillings, as against 70 shillings 11 pence last week. Very little Hematite is on offer, and rates keep stiffly up.

Manufactured Iron and Steel.—Business is fairly active in the finished branches of the trade, and in Staffordshire there is an improvement, some long deferred orders on home account having been placed, and several good foreign contracts having been booked. Lancashire Bar makers are particularly busy just now, despite some falling off in new work, the lessened output of the forges having put manufacturers in arrears with deliveries. In these circumstances prices are very firm, £10 5s. remaining the minimum for Lancashire, and £10 10s. the figure for North Staffordshire Bars delivered Manchester. In South Staffordshire, too, the tone is good, and makers of best Bars are receiving repeat orders at £11 10s., while for Common Iron £10 10s. to £10 15s. is realized. But prices are not so well maintained elsewhere. Angles and Ship Plates have come down to £8 2s. 6d. in Glasgow, and some further reductions are reported from Middlesbrough, where Iron Ship Angles have fallen 5 shillings, and Engineering Angles 2 shillings 6 pence. The average price of manufactured Iron in Scotland for May and June has been returned at £8 14s. 3.53d.

Engineering and Shipbuilding.—The engineering trades are well employed generally, but there is a lessening weight of new work in some branches, this being especially noticeable in all sections of trade either directly or indirectly connected with the textile machine industry. All sections of engineering that touch upon the very large development of electrical power for traction and driving purposes, together with the extension of electric lighting installations, are under a great pressure of work, with every probability of full employment for a considerable time to come. There is also general briskness throughout the locomotive building trades, and all branches connected with the construction of railway rolling plant. There is still a dearth of new work in the shipbuilding industry. The returns for July show that Scotch builders launched 21 vessels of 50,691 tons, as compared with 32 vessels of 52,528 tons last month, and 13 vessels of 22,050 tons in July, 1899. To the total the Clyde contributed 18 vessels of 46,091 tons, the Forth two of 2600 tons, and the Tay, one of 2000 tons. About 12,000 tons of new work was reported. This is a considerable improvement as compared with recent months. On the Wear eight vessels of 27,000 tons were launched, as against seven of 23,000 tons.

Comparison of Prices.—The annexed table shows the current prices compared with those of last week, and of the corresponding period last year:

	Aug. 2, 1900.	July 26, 1900.	Aug. 3, 1899.
Iron Ore—	s. d.	s. d.	s. d.
Rubio, Middlesbrough	21 9	21 9	17 0
Rubio, Cardiff	20 6	20 6	15 9
Pottery Mine, North Staffordshire	20 6	20 6	14 6
Hematite, West Coast (at mines)	17 6	17 6	16 0
Pig Iron—			
No. 3 Foundry, Middlesbrough	69 6	69 0	64 0
Warrants	69 9		63 1½
Scotch Warrants, Glasgow	72 0	70 11	66 0
Hematite Warrants, West Coast	82 9	83 4	76 0
Cold Blast (Foundry), South Staffordshire	130 0	130 0	110 0
Welsh Hematite, Cardiff	84 0	84 0	76 0
Manufactured Iron and Steel—	£ s. d.	£ s. d.	£. s. d.
Marked Bars, South Staffordshire	11 10 0	11 10 0	9 0 0
Common Bars	10 15 0	10 15 0	8 10 0
Steel Rails, Middlesbrough	7 10 0	7 10 0	6 7 6
Steel Rails, West Coast	7 5 0	7 5 0	6 5 0
Steel Rails, Cardiff	7 0 0	7 5 0	6 5 6
Steel Angles (eng.), Middlesbrough	8 10 0	8 12 6	7 2 6
Steel Angles (eng.), Glasgow	8 2 6	8 5 0	7 2 6
Steel Plates (ship), Middlesbrough	8 0 0	8 0 0	7 12 6
Steel Plates (ship), Glasgow	8 2 6	8 2 6	7 15 0
Tin Plates, Bessemer IC Cokes, South Wales	s. d. 14 6	s. d. 15 3	s. d. 16 0

—Iron and Coal Trades Review, August 3, 1900.

New York.

Office of *The Iron Age*, 232-238 William street,
New York, August 15, 1900.

Pig Iron.—The market continues irregular and is still in the buyers' favor. Inquiries are growing more numerous and more business is being done. The principal transaction during the week has been the purchase of about 5000 tons of off Bessemer Pig for malleable purposes, for delivery at Troy, Bridgeport and New Britain, on the basis of a shade under $16, delivered Bridgeport. The limit of phosphorus is 0.15, with silicon at 1 per cent. The same parties have purchased several thousand tons of Foundry Iron. Quotations are as follows at tidewater: Lehigh, Schuylkill and Virginia Irons, No. 1, $16.50 to $18; No. 2 X, $15.50 to $17; No. 2 Plain, $15 to $15.50; Gray Forge, $14 to $15. Tennessee and Alabama brands, No. 1 Foundry, $17.25 to $17.50; No. 2 Foundry, $16 to $16.50; No. 1 Soft, $17.25 to $17.50; No. 2 Soft, $16 to $16.50; No. 3 Foundry, $15 to $15.50; No. 4 Foundry, $14 to $14.25; Gray Forge, $13.75 to $14.25.

Cast Iron Pipe.—It appears that the Boston order was taken at $20.90 per net ton, delivered. During the week only small lots were placed, including one of 300 tons for a New England town.

Steel Rails.—The market is lifeless, with $35, at mill, still the nominal quotation. We quote Track Material nominally 1.80c. to 1.90c. for Spikes, 1.50c. to 1.60c. for Splice Bars, 2.25c. to 2.40c. for Square and 2.35c. to 2.50c. for Hexagon Bolts.

Finished Iron and Steel.—Some good contracts have been given out for Structural Material, including 1200 to 1500 tons for the Transit Building on Forty-second street, and 1500 tons for an apartment building at Madison avenue and Sixty-first street. About 300 to 400 tons have been placed for Communipaw piers of the Standard Oil Company. The American Bridge Company have se-

cured two bascule bridges across the Calumet River, involving 1000 tons, and the Grand Avenue Lift Bridge at Milwaukee, involving a like amount. The Missouri River Bridge, at Atchison, Kan., involves about 1300 tons; bridge work for the Ecuador Development Company, 1100 tons; for the New Haven Road, 800 tons, and the Rutland Road, 500 tons. Some additional bridge work is coming up in Japan. The contract for about 3000 tons for the Japanese Imperial Government appears to have been taken at a low price by a firm of merchants in London. The contract for the new East River Bridge has not yet been let. Contractors have been asked to state whether their shops have been in operation for more than a given period, and to report what arrangements they have to secure the special Steel required. We quote as follows at tidewater: Beams, Channels and Zees, 2.05c. to 2.15c.; Angles, 1.95c. to 2.05c.; Tees, 2.10c. to 2.20c.; Bulb Angles and Deck Beams, 2.35c. to 2.45c.; Universal Mill Plates, 1.30c. to 1.40c. Sheared Steel Plates are 1.25c. to 1.40c. for Tank, 1.40c. to 1.50c. for Shell, 1.50c. to 1.70c. for Flange, 2.10c. to 2.30c. for Fire Box, 3.50c. to 4c. for Locomotive Fire Box, on dock. Charcoal Iron Plates are held at 2.40c. for C. H. No. 1, 2.90c. for Flange, and 3.40c. for Fire Box. Refined Bars are 1.35c. to 1.40c.; Common Bars, 1.25c. to 1.35c.; Soft Steel Bars, 1.15c. to 1.30c., and Hoops, 2c. to 2.25c., base, on dock.

Metal Market.

Office of *The Iron Age*, 232-238 William street, New York, August 15, 1900.

Pig Tin.—Business has been very quiet during the week under review and prices have been declining. Transactions have been small and only scattered lots were sold. Closing quotations to-day name 31.55c. to 31.75c. for spot and 31.50c. to 31.65c. for August. London is quoted £142 10s. for spot and £137 for futures. Arrivals here thus far this month were large, amounting to 1820 tons. It is said that a goodly portion of this will go into warehouse.

Copper.—There is a diversity of opinion in the trade as to the present condition of the market. In certain quarters it is declared that the week has been a most quiet one, both as to domestic and foreign business, and that Lake Copper can be obtained at 16.50c. and Electrolytic at 16⅜c. Other parties seem to be of the opinion that business is heavy and that the outlook is most encouraging. These are the parties who control something like 70 per cent. of the country's production and their followers. The spot quotation for both Lake and Electrolytic given out in these quarters is 16¾c. It is evident that the large consumers and certain large producers have been parrying for some time, with the result that prices have steadily crept up on the consumer. A number of parties in the trade have taken sides with the producers referred to, and now they believe an upward march in prices to be inevitable, stating that the consumers have been forced to buy heavily in order to cover their requirements. The other faction declare that consumptive requirements have not been great and that the Calumet & Hecla interests have held their books open for some time at 16½c. The London metal merchants are united in a bullish stand and mention the great requirements of England for electrical purposes as well as the Pacific cable, the construction of which will require some 4000 tons. The situation has apparently reached a crisis and all hands are looking on awaiting actual developments. In the meantime the fact must not be lost sight of that certain influential parties in the trade claim that Lake can be secured at 16½c. Exports for the first half of this month amount to 5500 tons, which compares rather lightly with former months. The London market is quoted at the close to-day £74 2s. 6d. for spot and £74 12s. 6d. for three months' futures. Best Selected has advanced to £79.

Pig Lead—Is absolutely without change. A steady demand for small lots is reported. The American Smelting & Refining Company still quote 4.25c. for 50-ton lots, New York delivery, or 4.20c. St. Louis. London has advanced a shade, and is cabled to-day £17 17s. 6d.

Spelter.—The market is easy at 4.17½c. to 4.20c. for spot and this month. Consumption in this country has fallen off to the extent of about 25 per cent. during the first half of this year. This is as compared with the last half of last season. It is said that this is due to a marked lack of demand on the part of galvanizers, especially the producers of Galvanized Sheets. The brass industry is also said to have been rather quiet during the first half of this year. The London market is quoted £19 10s.

Antimony—Is unchanged. Hallett's is quoted 9½c. and Cookson's 10½c.

Nickel—Continues strong and unchanged. It is impossible to obtain large lots and small quantities are bringing from 55c. to 60c.

Quicksilver.—Wholesale lots of 50 flasks and more are quoted $51 per flask of 76½ lbs. London is quoted £9 5s. to-day.

Tin Plate.—The mills are still closed and consequently consumers are being supplied out of stock. In a few lines the stock has been exhausted, but as there is no buying for the future the producers and consumers are getting along very well together. The increased number of purchases indicate that consumers are fairly busy. The American Tin Plate Company are still quoting on a basis of $4.84 per box of 100-lb. Cokes, f.o.b. New York, or $4.65, f.o.b. mills.

Statistics of the Krupp Steel Plant.

The annual report for 1899 of the Krupp steel plant at Essen has just been issued, and from it we take the following interesting points concerning the magnitude and capacity of the great German works:

During the year 1899 the firm of Krupp comprised the steel plant at Essen; the steel works at Annen, Westphalia (formerly F. Asthover & Co.); the Gruson plant at Magdeburg-Buckau; the blast furnaces near Duisburg, Neuwied, Engers and Rheinhausen (the latter possessing three furnaces, each of 230 tons per diem capacity); a plant near Sayn; four coal mines (viz., Hannover shafts 1, 2, 3 and 4, and the Salzer and Neuack shafts), besides part ownership in various other mines; more than 500 iron ore properties in Germany, of which 11 are deep shafts fitted with mechanical equipment; various deposits near Bilbao, Spain; shooting grounds near Meppen, 16.8 km. in length, with an actual firing distance of 24 km.; three ocean steamers, several stone quarries and clay and sand deposits, besides the control and operation of the Schiffs & Maschinenbau Actiengesellschaft "Germania" at Berlin.

The principal articles of manufacture at Essen are ordnance, ammunition, gun barrels, armor plate for all protected parts of war ships, as well as for fortifications, iron and shipbuilding material, machine parts of every sort, rails, iron and steel plates, rolls, tool steel, &c.

The Essen plant is divided into the following departments: Two Bessemer works, containing altogether 15 converters: four Martin works, two steel casting works, puddle works, crucible steel plant, welding mill, foundries, works for casting guns and brass, annealing shops, hardening halls, crucible chambers, block rolling mill, rail rolling mill, plate mill, bolt and spring steel works, spring machine shop, hydraulic press plant and armor plate rolling mill, hammer works, wheel foundry, tire rolling mill, boiler shops, field railway construction shop, mechanical workshops (with file factory), four repair shops, railway machine shops, gun and ammunition shops, testing laboratory, two chemical laboratories, one physico-chemical testing laboratory, boiler house, electrical plant, gas works with one plain and two telescope gas tanks, holding respectively 5700, 17,500 and 37,500, altogether 60,700 c. m.; water works with three separate sources of supply, factory for fire brick and briquettes, brick kiln, lithographic and photographic establishments, together with a book bindery, freight office, telegraph, telephone, fire and safety departments, and food supply stores.

In the steel plant at Essen there were in operation in 1899 1700 different furnaces, forges, &c.; 400 different machine and workmen's tools; 132 steam hammers from 100 to 50,000 kg. falling power (in all 269,125 kg.); 30 hydraulic presses, two of 5000 tons each, one of 2000 and one of 1200 tons; 316 steam boilers, 497 engines from 2 to 3500 horse-power (altogether 41,213 horse-power), 558 cranes from 400 to 150,000 kg. carrying power (altogether 5,963,150 kg.).

At the mines an average of 1877 tons constituted the daily output of ore, while the production of coal in the mines proper averaged 3738 tons per diem. Coal and coke were consumed at the steel plant to the extent of 952,365 tons. The total consumption at the remaining works was 622,118 tons, or in all 1,570,483 tons—5000 tons daily.

The consumption of water at the steel plant amounted to 15,018,156 c. m., or as much as is required by the city of Frankfurt on the Main. The combined length of the water pipe was 171.59 km., that in the buildings 106.48 km. The consumption of gas for lighting purposes amounted to 18,836,050 c. m. (the consumption of the city of Leipsic for the same period was 21,931,140), the same supplying 2596 street lights and 41,745 lights in the works.

The electrical plant of the steel works possesses three engine rooms with six distributing stations, 26.85 km. of

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING AUGUST 15, 1900.

Cap'l Issued.		Sales.	Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.
$20,000,000	Am. Car & Foundry, Common..	2,752	15¾-15⅞	15⅞-16	.....	-16	-16¼	16 -16¼
20,000,000	Am. Car & F'y, Pref. (7 % Non-Cu.)	860	-63	.....	.....	-63	63 -63⅜	.....
19,000,000	Am. Steel Hoop, Common.....	8,080	.....	.....	.....	19 -19¼	19⅜-20⅞	20⅛-20⅜
14,000,000	Am. Steel Hoop, Pref. (7 % Cu.)..	3,380	.....	.....	.....	66 -67	67 -67¼	67 -67½
50,000,000	Am. S. & W., Common.....	23,190	33 -33½	33¼-33¾	33⅜-34	34 -34⅝	34½-35⅞	35⅝-36
40,000,000	Am. S. & W., Pref. (7 % Cu.).....	3,095	.....	.....	.....	74⅛-74⅞	-75	75¼-76¼
28,000,000	Am. Tin Plate, Common, N. Y...	17,190	22¾-23	.....	.....	-23½	23⅝-26½	26⅜-27⅜
18,325,000	Am. Tin Plate, Pref., N. Y. (7 % Cu.	1,255	.....	.....	.....	.....	78 -79½	79 -79¼
7,500,000	Bethlehem Iron†.....	385	.....	-57	-57	.....	.....	.....
15,000,000	Beth. Steel, Par $50, $1 paid in...	100	.....	.....	-15	.....	.....	-15
7,974,550	Cambria Iron, Phila.*.....	4	.....	.....	.....	.....	-45	.....
16,000,000	Cambria Steel**.....	3,220	16⅜-16½	.....	-16½	16⅜-16½	16½-16¾	16¾-16⅞
11,000,000	Col. Fuel and Iron.....	3,860	.....	.....	.....	35½-36⅛	36 -36½	35½-35⅞
46,484,300	Federal Steel, Common..... ..	24,155	32¾-33¼	33¼-33½	33⅝-34	33⅞-34½	34 -35½	35¼-35¾
53,253,500	Federal Steel, Pref. (6 % Non-Cu.)	4,001	-66¼	.....	.....	66¼-66½	66½-67½	66⅝-67⅝
32,000,000	National Steel, Common, N. Y...	5,700	.....	-25	.....	25 -25¾	26 -27⅛	27 -27½
27,000,000	Nat'l Steel, Pref., N. Y. (7 % Cu.)	1,669	.....	.....	.....	83⅜-85⅛	-85¼	85 -85½
40,000,000	National Stl. Tube, Common, N. Y	18,520	45⅞-46½	46⅛-46¾	45¾-46¾	46½-47	46⅞-47¼	47 -47⅝
40,000,000	National Stl. Tube, Pref., N. Y..	7,890	90¼-91¼	91 -91¼	91 -91¼	91¼-91¾	91¾-92	92 -92⅜
5,000,000	Penna., Common, Phila.....	.....	.....	.....	.....	.. ..	.....	.....
1,500,000	Penna., Pref., Phila.....	5	.....	-75	.....	.....	.....	.....
12,500,000	Pressed Steel, Common.....	1,110	-40½	-40¾	-40½	-40½	40⅞ -41	40½-41
12,500,000	Pressed Steel, Pref. (7 % Non-Cu.)	910	-73	.....	.....	71¾-71⅝	71⅝-72¾	.....
27,352,000	Republic Iron & Steel, Common.	4,290	10¼-10¾	10¼-10½	-10¾	10¼-11	10¾-11¼	11⅞-12⅛
20,852,000	Repub. Iron & Steel, Pref. (7 % Cu.)	1,500	51¼-51½	.....	-53	53 -53¼	-53½	53½-54
7,500,000	Sloss-Sheffield S. & I., Common..	.....	.....	.....	.....	.....	.....	.....
6,700,000	Sloss-Sheffield S. & I., Pref.....	355	.....	.....	.....	.....	65¼-66	.....
20,000,000	Tennessee Coal and Iron.....	7,520	-69½	70½-70¾	-70½	70½-72	71½-72½	71½-72¼
1,500,000	Warwick Iron & Steel (par $10)..	289	7¾- 8	.....	- 8	7⅞- 8	- 7⅞	- 7⅞

* Par $50. ** $9 per share paid in. † 6% guaranteed by Beth. Steel Co. Late Philadelphia sales by telegraph. ‡ Ex-dividend.

Bonded Indebtedness: Am. S. & W., $130,656; Am. Tin.Plate, none; Am. Steel Hoop, none; Cambria Iron Co., $2,000,000 6 % debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., $9 822,000 Illinois 5 %, $7,417,000 E. J. E. R. R. 5 %, $1,600,000 Johnson 6 %, $6,732,000 D. & I. R. R. R. 5 %, $1,000,000 2d D. & I. R. R. R. 6 %, $:0,000 land grant D. & I. R. R. R. 5 %; National Steel, $2,561,000 6 %; National Tube, none; Tennessee C., I. & R. R. Co., $8,367,000 6 %, $1,114,000 7 %, $1,000,000 7 % cu. pref.; Pennsylvania Steel, $1,000,000 5 %, Steelton, 1st, 1917. $2,000,000 5 %; Sparrow's Point, 1st, 1922, $4,000,000, consolidated, both plants; Bethlehem Iron, $1.351,000 5 % maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6 % $880,000, Col. Coal & Iron Con. Mort. 6 % $2,810,000, Col. Fuel & Iron Gen. Mort. 5 % $2,303,000. Also outstanding $2,000,000 preferred stock with accumulated dividends of $640,000 to June 30, 1899.

underground and 90 km. of overground cable for lighting, and feeds 877 arc lights, 6724 small lights and 179 electro motors.

As regards means of communication Krupp's plant is singularly well supplied. A standard gauge railway net is in direct track connection with the Essen Railway Station, North Essen and Berge-Borbeck. Communication with these three stations is effected daily by 50 trains. In all the net comprises 58 km. of track, 16 locomotives and 707 cars; furthermore there is a narrow gauge railway net with 44 km. of track, 26 locomotives and 1209 cars.

Krupp's telegraphic net contains 31 stations with 58 Morse apparatus and 81 km. of wires. It connects with the Imperial Telegraph Office in Essen, and the year's business between the factory and the city amounted to no less than 22,787 sent and received dispatches. The long distance telephone possesses 328 stations with 335 apparatus and 320 km. of wires. The daily calls average 900 to 1000. In the testing and trial rooms 173,209 tests were made, of which 87,626 were breakage and 83,262 bending tests.

The fire department employs 95 men. The works proper contain 347 and the outbuildings 121 hydrants, while in addition there are 35 extra water sources for use in case of necessity, 82 electric fire alarms, besides the 330 odd telephone call stations.

The laborers live in what are called colonies, a group of settlements comprising Baumhof, Nordhof, Westend, Kronenberg, Friedrichshof, Schederhof, Alfredshof and Altenhof, with 4210 family dwellings. The total number of workingmen's dwellings erected by the Krupps up to April 1, 1900, was 4853. There are, furthermore, 1 hospital, 2 barracks for epidemic cases, 1 convalescent home, 1 workmen's eating house, 2 lodging houses for unmarried men, 1 club house for clerks, 1 club house for works foremen, 1 housekeeping school for adults, 1 industrial school for adults, 3 industrial schools for children, 1 library, &c.

According to the census of April 1, 1900, the total number of persons employed at the Krupp Works, including 3559 office employees, was 46,679. Twenty-seven thouand four hundred and sixty-two of this number are employed at Essen, 3475 at the Gruson works in Buckau, 345 at the Germania in Berlin and Kiel, 6164 in the coal mines, 6128 at the ore mines, the shooting grounds and other places.

Two French chemists, Desgrez and Balthazard, according to a Paris dispatch, have made a discovery which enables them to renew air indefinitely. Bioxide of sodium in process of decomposition gives off oxygen, and at the same time absorbs carbonic acid gas, thus providing pure breathing air and removing the air that is vitiated. The chemists constructed a sort of diver's helmet of aluminum, which, with a lining of bioxide of sodium, permits persons to move and work for hours in otherwise unbreathable surroundings.

Iron and Industrial Stocks.

Renewed interest is being taken in the steel stocks. Transactions have latterly been on a much more extensive scale, and some stocks that have been neglected for a long time have suddenly become active. Considerable enhancement in values has taken place, especially in what are known as the Moore stocks. Coupled with the activity in these stocks is a report that arrangements are at last being made to amalgamate National Steel, Steel Hoop and American Tin Plate into one corporation.

	Bid.	Asked.
American Bicycle Company, Common.....	6	6¾
American Bicycle Company, Preferred.....	30	32
American Bicycle Company, Bonds.....	..	80
E. W. Bliss, Common.....	..	137½
E. W. Bliss, Preferred.....	125	..
Cramp's Shipyard Stock.....	75	80
Diamond State Steel.....	3¾	3⅝
International Silver, Common.....	4	5
International Pump, Common.....	19	20
International Pump, Preferred.....	65½	66½
Otis Elevator, Common.....	28¼	29
Otis Elevator, Preferred.....	86½	87½
Pratt & Whitney, Common.....	3½	5
Pratt & Whitney, Preferred.....	50	55
U. S. Projectile.....	95	100
Tidewater Steel.....	8⅝	9
U. S. Cast Iron Pipe Company, Common.....	3¾	4½
U. S. Cast Iron Pipe Company, Preferred.....	32	35
H. R. Worthington, Preferred.....	..	110
Empire Steel, Common.....	6	10
Empire Steel, Preferred.....	30	36

Niles-Bement-Pond Company.—The Niles-Bement-Pond Company have declared a quarterly dividend of 1½ per cent. on their preferred stock, payable August 20. A semiannual dividend of 3 per cent. has also been declared on their common stock, payable in installments—the first installment on September 20 and the second December 20. The company report for the six months ending June 30:

Net earnings.....		$625,717.00
Reserve for depreciation.....	$46,361.00	
Dividends on preferred stock.....	60,000.00	
Semiannual 3½ per cent. on common stock	150,000.00	
		256,361.00
Surplus		$369,356.00
Previous surplus.....		430,644.00
Present surplus.....		$800,000.00

The Colorado Fuel & Iron Company have declared a dividend of 8 per cent. on the preferred stock, payable September 5. With the payment of this dividend there remains 16 per cent. in accrued dividends, due for the fiscal years 1899 and 1900.

The Geological Survey of Canada reports that the production in 1899 was 15,078,475 pounds of copper, 10,931 net tons of lead, and 5,744,000 pounds of nickel.

The New York Machinery Market.

Office of *The Iron Age*, 232-238 William street,
New York, August 15, 1900.

Business in the machinery district during the week under review was as good as could be expected at the hight of the vacation season. Numerous communications have been received by machinery merchants, stating that propective purchasers have gone off on the proverbial fishing trip. It is reported that quite a number of concerns are looking about for shop equipments. The purchasing during the last week was confined to small lots, however. We hear of no further reduction in prices. There is a pretty fair demand from abroad for the smaller types of machine tools, but business in the heavier machines has fallen off completely. It is said that this is due to the high prices which are being demanded at present by the builders. In some instances these prices are said to have been advanced 45 per cent. within the last year. A large German importing house, who are represented in this market, report that during the last six months they have received no orders for machines weighing more than 30,000 pounds, whereas prior to the heavy advances in prices such orders were quite numerous.

It is reported that Asa S. Cook of Hartford, Conn., has received an order from abroad for an entire screw machine equipment for a large screw plant which is to be built in Europe.

The Singer Mfg. Company of Elizabethport, N. J., are constantly buying machine tools for the equipment of the large addition which they have just built to their works. It is said that they have recently given Manning, Maxwell & Moore an order for a large number of Pratt & Whitney Lincoln millers. The Prentiss Tool & Supply Company and the Garvin Machine Company have also received substantial orders for milling machines from this company. It is said that the buying has only begun.

Judging from present indications considerable business is to be had from several good automobile companies. The Baldwin Automobile Mfg. Company, who have recently equipped an excellent plant at Connellsville, Pa., are about to double it in size. Horatio Fraser, the president and general manager of the company, was in this city yesterday looking up machinery matters. E. C. Stearns of Syracuse, N. Y., who has for some time been prominent in the bicycle and hardware trade, has gone into the building of automobiles. It will be recalled that the Stearns bicycle plant was purchased by the American Bicycle Company. Mr. Stearns has acquired the Barnes bicycle plant, and will convert it into an automobile factory. This will require the purchasing of a considerable quantity of machinery.

Arrangements are being made by the New York Automobile Company for the erection of a large plant. The location has not as yet been announced and, in fact, we are not permitted to give the location of the New York office of the company. The company are backed by certain Standard Oil magnates, who have interested themselves in a number of manufacturing projects lately.

Jones & Laughlin of Pittsburgh were in the market during the week for a number of machine tools, which included a 54-inch planer. They bought the planer.

For almost two years past the Central Railroad of New Jersey have been trying to bring plans to a close for the building of a large machine shop at Elizabethport, N. J. The scope of the project has steadily widened, and now the scheme includes not only a machine shop, but an entire system of railroad and car shops. Parties in the trade have received blue prints showing the extent of the proposed operations. There will be an erecting machine shop, 120 x 514 feet; a boiler shop, 300 x 100 feet; a blacksmith shop, 80 x 300 feet; a passenger car shop, 100 x 362 feet; a paint shop, 100 x 362 feet; a planing mill, 70 x 250 feet, and a store house and office building, 50 x 250 feet. The power house will be 100 x 125 feet, and there will be various other outbuildings and numerous turntables. G. De Witt Smith is the company's purchasing agent and W. Mackintosh is the superintendent of motive power.

The Stanley Electric Company and the Northern Electric Mfg. Company have been consolidated. It is reported that the consolidated company will open offices in New York City. A meeting will be held in this city on the 18th inst., at which the arrangements will be completed.

The contract for the equipment of the new power station which is to be erected at New South Wales for the Sydney tramways was awarded to the General Electric Company. It is said that the contract price for the entire equipment is somewhat above $800,000. The General Electric Company will furnish two 1500 kw. units, and will sublet a contract for two engines of a nominal capacity of 1500 horse-power. These engines will be built by the E. P. Allis Company. The requisite piping, fittings and like accessories will be furnished by the Crane Company of Chicago. Charles Oliver, chief inspector of tramways, superintended the purchasing.

Westinghouse, Church, Kerr & Co. have received the contract for furnishing all the engineering apparatus required in the new extension to the Manhattan Hotel. The contract is valued at about $200,000. In the power plant there will be four 200 horse-power engines direct connected to Westinghouse generators. Other material included in the contract consists of piping, heating and ventilating apparatus, &c.

In previous issues we have alluded to the works which are being built at Eddystone, Pa., by the Gruson Iron Works. We are now informed that this company are again in the market for structural material for a number of new buildings. The principal building, which is to be used as a machine shop, will require a 40-ton crane as well as a complete equipment of machinery. The company are to make heavy castings, and propose building the Gruson chilled cast iron coast defense turrets. Their principal offices are located in Philadelphia.

Woolston & Brew of 141 Broadway have received an order from the Eastwood Wire Mfg. Company of Belleville, N. J., for a 125 horse-power Brown engine. They also received an order from the Utica Cotton Company of Utica, N. Y., for a cross compound condensing engine of 600 horse-power.

Work is now under way for the construction of a new foundry and machine shop at Belleville, N. J., by the Atlas Mfg. Company. The company manufacture textile machinery, and have a plant at present on the corner of Cross and Front streets, Newark, N. J. New equipment will be required for the new plant.

Contracts have just been placed by F. D. Mack of 346 Broadway for a quantity of machinery for the equipment of a number of new mining plants. For the Missouri Zinc Fields Company of Webb City, Mo., Mr. Mack has purchased two 200 horse-power Corliss engines from the E. P. Allis Company. He has purchased two 120 kw. Westinghouse generators, three sets of Allis crushing rolls and a number of 9 x 15 Blake crushers. He has also purchased a 1,000,000-gallon Cornish pump and two 300 horse-power Sterling water tube boilers. This mill will have a daily capacity of 240 tons of ore. An exact duplicate of this equipment has also been purchased by Mr. Mack for a new plant which is being erected at Aurora, Wis., for the Boston & Aurora Zinc Company. A plant which is to have a capacity of 120 tons per day is to be built at Joplin, Mo., for the Devonshire Mining Company. It will contain principally Allis machinery and equipment.

We are informed that an entire new plant is to be built by the Piano & Organ Supply Company of Chicago. Westinghouse, Church, Kerr & Co. have been awarded a contract for the complete power equipment. They were also the designers of the new plant. Westinghouse, Church, Kerr & Co. have also received a contract from the Pennsylvania Railroad for a new power house, and about 1000 horse-power of boilers and automatic stoking machines. The work is to be erected at Altoona, Pa. It is hinted in the trade that an addition will be made to the company's machine shop at Altoona.

Offices have been opened at 95-97 Liberty street by the Epping-Carpenter Company of Pittsburgh, Pa. The offices are in charge of Herbert S. Wilson, who was formerly with the International Steam Pump Company. The Epping-Carpenter Company build a complete line of duplex, single and deep well pumping machinery, and we are informed that they have recently erected a new plant, thus enabling them to serve the trade promptly.

Petroleum in Algeria.—In a recent report of the British Consul-General at Algiers it is stated that three companies have applied for concessions for working petroleum wells. The localities to be exploited are: Aïn Teft, in the department of Oran, and the Tiliovanet district, in the commune of Hillil. Two companies have applied for concessions in the latter district. A report has lately been issued by M. Henry Neuberger, who was commissioned by the Governor-General of Algeria to examine the petroliferous possibilities of the department of Oran. He states that four zones rich in petroleum exist in Western Algeria; they stretch from northwest to southeast for a distance, which in the south zone (Flitta country) apparently exceeds 125 miles. The soil is precisely similar to that of the rich deposits of Baku and Galicia, and seems to warrant great expectations. Mineral oil exists, without doubt, at various depths in the department of Oran, and has, in fact, been struck in one district of that department, but not as yet in sufficient quantity to justify working. In the department of Constantine there are also petroliferous districts, which appear to be the direct continuation of the zones observed in the department of Oran; their composition and lie are identical.

Industrial Photography at the Paris Exposition.

The following article is from *Engineering* of London:

A very important branch of industrial photography, which may be defined as the art of reproducing cheaply and rapidly working drawings of all sizes, by exposing to the light prepared surfaces in contact with such drawings made on tracing paper, is to be found exemplified at the Paris Exhibition. The old method of reproducing working drawings, which is still employed, and in many cases is the most useful, is the lithographic process, in which the drawing made on a surfaced paper, with special ink, is transferred to a lithographic stone, or to a sheet of zinc, the result depending in each case on the retention of water by the non-inked surface. For a vast range of purposes this is the fundamental engraving process, but it requires great skill on the part of the operator, and a costly plant; so that, unless in very exceptional cases, it is entirely unsuited for the purpose we are considering, that of producing a small number of copies, which are known in this country under the general term "blue prints."

The extent to which such reproductions are required is far larger than would be imagined. Not only is the demand constant among engineers, architects, contractors, &c., but in Government technical departments the necessity for a limited number of copies of drawings quickly produced is constantly on the increase. The production of several tracings from a drawing involves a considerable expense and delay; for this reason a good reception was assured to any process which with only one tracing allowed faithful and cheap reproductions to be made accurately and rapidly. Such processes form now a very large branch of industrial photography, and they have been brought to a remarkable degree of perfection during the 30 years that they have been in use. From the commencement, the system was favorably received, and the earliest methods, although crude and imperfect, came largely into use; the original methods are still practiced on a larger scale, on account of the ease of manipulation and cheapness of material employed. As a matter of historical interest, as well as because they are still more largely used than any other, these processes call for a short notice. Adopting a chronological order, they may be placed as follows:

1. The ferroprussiate process, in which white lines on a blue ground are produced.
2. The ferrocyanide process, with blue lines on a white ground.
3. The "heliographic paper" process, with dark lines on a gray ground.

The Ferroprussiate Process.

The paper on which the drawing is to be copied is sensitized with a solution of citrate of iron and red prussiate of potash. To obtain the copy of a tracing, the sheet, after saturation with the sensitizing solution, and drying in the dark, is placed in a printing frame beneath, and in close contact with, the tracing, and exposed to the light for three or four minutes; it is then washed until the lines of the tracing become visible as white lines on a blue ground. If the exposure has been insufficient, and the blue ground appears too pale, intensification can be produced by a 4 per cent. sulphuric acid bath. For making corrections or additions to the print, lines or writing can be put on with an oxalate of potash solution; this removes the blue tint.

The Ferrocyanide Process.

This process, by which it is possible to make direct positive prints, was the first step taken toward important improvements in the reproduction of drawings. The process dates from 1877. The ferrocynide paper is prepared with a sensitizing solution, the nature of which varies according to the class of work to be done. The following are two formulas:

	Grams.
1. Perchloride of iron	80
Gum	120
Citric acid	30
Water	1,000
2. Tartaric acid	90
Persulphate of iron	110
Perchloride of iron	120
Gum solution	1,000

This paper when prepared is of a yellow color; when exposed to light beneath the tracing, important changes take place in the sensitized surface which is not protected by the lines of the drawing. The salts of iron are reduced, the exposed surface become white, and as soon as the drawing appears in yellow lines, which can be ascertained by raising the back of the frame, the paper is removed and put in a ferrocyanide or potassium bath, which immediately forms Prussian blue by combining with the iron salts that are not reduced, that is to say, in those parts of the sheet that have been protected from the light. In this way the drawing is developed in a bright blue tint. The sheet is afterward washed and then placed in a bleaching bath made up in the proportion of 40 grams of sulphuric acid and 1000 grams of water; finally the sheet is subjected to a liberal washing, and any spots which do not appear to have been completely bleached are treated with a soft brush.

Reproduction on Heliographic Paper.

This process has the advantage over the preceding ones of demanding far less handwork, but it has the inconvenience of being much slower. The paper, which it is more desirable to purchase than to prepare, is treated in precisely the same way as has been already described. Development is obtained by placing the sheet in a gallic acid bath, and a subsequent washing completes the operation. This process has become extremely popular, on account of the reproduction being in practically black lines on a white ground. In reality, the color of the lines is a very dark violet, and that of the paper a pale gray. There can, however, be no doubt that the results obtained are more satisfactory than in the preceding processes. In order to obtain the best results very transparent paper should be used for the copy, and the Indian ink, with which the tracing is made, should be absolutely black.

There are no examples of either of these three processes calling for special notice at the exhibition. In fact, they are all wanting in originality, and may before long be superseded by the new method, the so-called photozincography—that is to say, the transfer of the drawing to be reproduced to a sheet of zinc, which will freely receive a film of printing ink in the same way as a lithographic stone, and from which any desired number of copies can easily be taken. In photography, a negative is produced upon the sensitized plate, and the intermediary of a sensitized paper or other surface is necessary for the production of reversed positive pictures. In photozincography the problem was how to obtain a positive plate from a positive drawing, and from this to make copies on ordinary paper. As worked out, the only condition is that this drawing should be on transparent paper; the results that have been obtained we will now describe.

Photozincography.

The application of the principle of photozincography, to which it appears that Austria justly lays claim, but which has been greatly improved in France, after having remained practically dormant for nearly half a century, has of late years come very largely into use. As is well known, the process is based on the curious properties possessed by a certain class of bitumen, to become insoluble in oil of turpentine, it it has been exposed to light, at the same time remaining soluble under the action of benzine. Given, therefore, a film of bitumen on a sheet of zinc properly prepared, the advantages that can be obtained through this curious property will be at once evident. The bitumen being soluble in benzine the question of preparing it in a liquid condition was solved. In order to fix it on the zinc, the latter is treated with a solution of gall nuts and chlorhydric acid, the proportions generally used being 25 grams of acid for a filtered solution of 1.5 kg. of nut galls in 8 litres of water, reduced to 5 litres by evaporation. In the dark room a solution is prepared of 80 grams of bitumen and a litre of benzine; the zinc plate, previously dried and carefully cleaned, is covered with a thin film of this solution, and is therefore converted into a sensitized plate. The tracing, of which a copy is to be made, is then placed over the zinc, in a printing frame, and exposed to light, after which, in order to develop it, the zinc is plunged into a bath of oil of turpentine. The bitumen, which had been covered by the black lines of the tracing, and therefore, which had been protected against the action of light, remains soluble, and in the bath these portions are gradually dissolved out, leaving the bright surface of the zinc clear; the image thus obtained is a negative one. When this stage has been reached the plate is very freely washed and dried; it is then placed in an acetic acid bath which attacks the exposed metal, destroys the action of the first preparation of gall nuts, and so affects the surface of the zinc with which it comes in contact that it is well adapted to receive a film of printing ink. The second phase of the operation consists in reversing the development; a film of varnish is passed over the plate which attaches itself only to the exposed portions. The whole surface is then thoroughly cleaned with a rag soaked in benzine which dissolves the film of bitumen that had been exposed to light, the drawing remaining, of course, unaffected, and being converted by this action from a negative into a positive; as by the previous treatment the surface was specially prepared to receive ink, the rest of the operation is a simple one.

If it is not a question of reproducing from a tracing, if an engraving or a map, for example, has to be copied, a photographic negative is first taken on a celluloid or

other film; this negative is placed over the bituminized zinc as before, and after the process has been completed, the image obtained on the zinc is naturally positive, and it appears clearly on the bitumen covering the plate. The application of the nut gall solution imparts to the surface of the zinc the curious property of absorbing moisture freely and of rejecting the printing ink over the exposed portion; the lines can then be inked up with an ordinary roller. This process is, of course, very largely employed in modern engraving art, and it will be readily seen how this system of reproduction may render very great services for the special purpose under consideration; the process is simple, and with a little practice the results obtained are superior to those given by either of the processes previously mentioned.

At the exhibition it is only in the French court that examples of this industrial photozincography are shown, this appearing to indicate that the system is not yet in current use among engineers, architects, &c. Only a few examples, indeed, are to be found even in the French section, and notably in the exhibit of Mr. Braines of Paris, where there are given some excellent specimens of a subject enlarged and reduced by the process, as well as maps and other subjects.

Chromo-Lithograph.

It will, of course, be understood from what we have already said, that the drawings to be reproduced, as well as the reproductions, are made only in one color. Very shortly, however, it would appear that a special chromo-lithographic process will be in use, by which at least three primary colors—red, yellow and blue—will be freely rendered. This process has already entered largely into artistic reproductions; all that is now necessary is to co-ordinate certain practical data in order to extend the system economically on a sufficiently large scale for its application to working drawings. The theory of chromo-lithography does not come within the scope of this article, but its industrial application to drawings is so interesting that a few words may be added here upon this subject. If a drawing is finished in different colors it is necessary to analyse it by photography, so as to separate each of them and make for each a special *cliché* from which superimposed printings will reproduce the original. Up to the present time only red, yellow and blue are thus reproduced photographically; industrially this range is sufficient, and a general idea of the process can be given in a few words, it being premised that the colors are not theoretically perfect. Approximately white is a very light gray, and black is a very dark gray. Knowing that the superposition of the three colors, red, yellow and blue, give, according to the intensity of the tints, a gray color approaching black, we have:

Red and blue—that is to say, violet, + yellow = black.
Yellow and blue—*i. e.*, green, + red = black.
Yellow and red—*i. e.*, orange, + blue = black.

Now a yellow object appears brown seen through a violet screen; a red object seen through a green screen appears black; a blue object seen through an orange screen appears black; the brown and the black not having any action on the salts of silver more than on the bitumen, it results that if we photograph a colored drawing after having placed between this drawing and the sensitized plate an orange screen, we shall have a negative in which all the clear portions will correspond to the different intensities of blue, and consequently the positive print from this will give the various values of blue. In the same way the green screen will give the values of red, and the violet screen the values of the yellow. A series of superimposed printings with proper colored inks from the zinc plates already described will reproduce the drawing in its original colors. This is the problem which is being vigorously attacked in its special application to the cheap production of working drawings, and there is reason to suppose that the process will soon become a practical one.

The production of iron ore in Lorraine was 6,972,690 metric tons. Of this quantity, 3,739,536 tons were smelted in the district, 1,348,804 tons were forwarded by rail to the furnaces of the Saar district, 701,665 tons were shipped to the Rhenish province and Westphalia, 550,306 tons went to Luxemburg, 477,696 tons to France, and 154,683 tons to Belgium.

The promoters of the Pan-American Exposition at Buffalo have planned an exhibit of war material of American manufacture. It will be a collective commercial one, in contradistinction to a Government display. All articles of American manufacture suitable for war purposes will be shown, and that range is rather broad, including, as it does, everything from a 12-inch 50-ton gun to a pocket emergency ration. Everything in the display will represent something purchasable from private interests in this country. The exhibit will be shown in two large buildings. Between them will be built a full size Gruson turret. Back of the turret will be a full size military mast of the "Oregon" type, fitted with fighting tops mounted with rapid fire guns. That feature will probably be built by one of the most prominent shipbuilding firms of the country. At one end of the gun sheds will be placed a 12-inch 50-ton gun, and at the other a dynamite gun. As a special feature of the exhibit it is planned to fire a long range shot from the big gun for the purpose of beating the world's record for range.

United States Consul Albion W. Tourgee, in a report from Bordeaux, quotes the French Minister of Agriculture as saying that the deficiency of the present wheat crop in France, in excess of the surplus remaining over of the crops of 1898 and 1899, will amount to about 30,000,000 bushels. While the experts, so called, disagree as to the probable quantity of wheat France will want to meet the expected deficiency, the outlook is that the United States will increase exportations of this cereal to France to a considerable extent. In 1898 we sent over 26,000,000 bushels of wheat to France. In 1899 there was a sharp falling off.

E. W. Parker's revised figures of the production of coal in the United States in 1899 are as follows: Anthracite coal, not including the production of Colorado and New Mexico, 53,944,647 gross tons; bituminous coal, including lignite or brown coal, cannel, splint and block coals, and the small anthracite production of Colorado and New Mexico, 172,608,917 gross tons: total coal production in 1899, 226,553,564 tons.

According to the semiofficial *Fremdenblatt* of Vienna, it is intended shortly to send three commercial reporters (*Referenten*) abroad from Austria-Hungary. Berlin will be the fixed abode of one of these, while the two others will be charged with commercial inquiries in transoceanic countries, and more especially in Japan and Australia. Besides this, the reporters in question will have, on their return home, to collect information respecting the more important commercial centers in East Africa and in India. The persons in question will be appointed for a term of one year.

At Camden, Maine, was launched on Tuesday what is said to be the largest wooden sailing vessel in the world, the six-masted schooner "Wells." The dimensions of the vessel are as follows: Length of keel, 302 feet 11 inches; beam, 48 feet 6 inches; depth of hold, 23 feet. The vessel is built of yellow pine and oak. She is fitted with all the most modern appliances, is of 2750 tons net register and has a carrying capacity of about 5000 tons.

The Havana Municipal Council has rejected by a vote of 20 to 1 the new city charter which has been in preparation for more than a year. Governor-General Wood admits that the new charter in some respects is not adapted to Havana. Municipal business in that city will be carried on under the old Spanish charter until a more suitable instrument is adopted.

The final meeting of the Superior Jury of Awards of the Paris Exposition, held on Tuesday, shows 42,790 to be the total number of awards made to exhibitors from all countries at the exposition. They are divided into 2827 grand prizes, 8166 gold medals, 12,244 silver medals, 11,615 bronze medals and 7938 honorable mentions.

The lease of the Laramie Rolling Mills, formerly held by Otto Gramm of Laramie, Wyo., has passed into the hands of the Colorado Fuel & Iron Company. The name of the old company, the Laramie Iron & Steel Company, will be retained. C. S. Robinson, general manager of the Colorado Fuel & Iron Company, is president of the new company. Extensive improvements will be made and a large lot of new machinery installed.

There are reports to the effect that J. P. Morgan & Co. of New York are receiving subscriptions to the securities of the Cullen Brothers & Lewis Steel Company, who are to take over the Troy Steel Company of Troy, N. Y.

J. A. Horton, formerly the New York representative of the Mossberg & Granville Mfg. Company, is now in charge of the firm's correspondence at the main office at Providence, R. I. F. O. Adams succeeds him as manager of the New York office.

The Palmer Steel & Iron Company of Chicago have signed the Amalgamated Workers' scale, and ordered their 400 men, at Muncie, Ind., to report for work.

HARDWARE.

Condition of Trade.

HARDWARE prices show a limited number of quotable changes, with the trend toward lower values. Manufacturers are not generally making a readjustment of prices, and the hope is quite freely expressed in the trade that the exhibition of some firmness in resisting the downward tendency may have a reassuring effect on buyers generally. Prices in some lines have reached so low a point as to considerably stimulate the growth of the export trade. Reduced prices are thus enlarging our Hardware markets. The volume of domestic business continues of about the same proportions as in the past few weeks. Jobbers' and retailers' stocks are low, and constantly need replenishing. Orders are for limited quantities only, and not until prices become more settled or the consumption of Hardware materially increases will buying be on a more liberal scale.

Chicago.

(*By Telegraph.*)

The stores of the local Hardware jobbers have been enlivened by the presence of a number of visiting merchants and traveling men from the South. Trade continues in fairly even volume from week to week, so even in fact as to be almost monotonous. There is, however, quite a shipment this week of goods for early fall use. Stove Boards, Husking Pegs and other seasonable goods are moving more freely. Some of them were ordered last spring, with instructions to delay shipment until asked for. A few are recent purchases. There seems to be some disposition to buy not quite so closely to immediate requirements, though the waiting policy is the one most in evidence. The city trade shows little recuperation from the comparative dullness of the past few months, but trade from all sections of the agricultural districts is pronounced uniformly good. Depletion of stock has gone so far, on the average, that considerable purchases are requisite to keep up with the current demands from consumers. The trade is less disposed to look for decidedly lower quotations, the turn in Bars having a perceptible effect. Heavy Hardware is not up to the volume of last week. This is considered only a temporary cessation, for the various small consuming factories are preparing for fall activity.

St. Louis.

Merchants have again opened up the week in a manner agreeable to jobbers. It is not to be supposed that orders and the nature of their specifications outstrip those of last year, but those voluntarily sent in this year are encouraging. A reasonable amount of care is taken by both jobbers and retailers in the making of purchases, but on no side has there been heard any remark expressive of lack of money. Abundant crops have favored nearly the entire territory tributary to St. Louis and out of town retailers are being correspondingly benefited. The satisfactory condition of farmers has caused a large sale of Sisal Rope, and an advance is stated to have taken place in the sizes most in demand. From regions north the call for Bale Ties is quite pronounced, the trade mentioning also an advance in this item. Nuts, Washers, and Carriage, Machine and Stove Bolts are in good demand. There is some weakness in Black Sheets, Galvanized being fairly well maintained. The demand for special Wire products is improving, orders being numerous, but not for large quantities.

Baltimore.

CARLIN & FULTON.—With the temperature of the last two weeks ranging, according to official records, about 100 degrees and somewhat above par on the level where we live and move and have our being, very little energy can be thrown into business.

Our traveling salesmen also report business greatly interfered with by the intense heat, which seems general throughout the whole country.

Rain had been greatly needed by the farming community, but now that the camp meeting season has begun the long protracted drought will probably end, though great damage has resulted to some of the growing crops.

Owing very much to the above causes the demand for goods has been only moderate; nevertheless in many lines, such as Nails and Wire, the market seems steady. In some items, such as Bolts, which have been unreasonably high, there have been concessions made of which the retailer has no doubt received the benefit in his orders.

It seems to be the general opinion that while the fall trade may be a little later than usual it will be satisfactory in volume, there being but little of a disturbing character except the natural disposition of the average individual to devote a great deal of time to the discussion of politics and to making direful predictions as to the future of the country should his party not get in.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—The business situation remains in practically the same condition as outlined in our preceding reports. A free movement of merchandise still continues along the regular defined channels, with few changes of any kind and none of importance to distinguish the present from weeks of recent date.

The prospects for a very large yield of corn were never more favorable. Copious showers of rain have been general throughout the corn belt, and reports received from nearly all sections are of a very encouraging character. The crop is now so far advanced that little or no danger is feared from any source.

As long as these conditions prevail there is no likelihood of any diminution in the volume of business.

San Francisco.

MILLER, SLOSS & SCOTT.—The month of July shows a falling off in trade as compared with the month of June, as the country trade has hesitated to stock up or purchase supplies while the market is on a decline. Since advices have been coming in that prices are stiffening in the iron and steel line there is more of a demand and more liberal orders are coming in. The requisitions for supplies for the army and navy in China and the Philippines have caused quite an increase in trade, and at the wharves in San Francisco transports are loading for the Orient. The fruit and wheat crops of the coast are in good condition and from the outlook will exceed last year's, and the month of August promises to be a prosperous one.

Cleveland.

THE W. BINGHAM COMPANY.—The extremely hot weather which has prevailed over the country generally for the last week has retarded trade very materially. Orders continue small, but are of a general assortment. There are no changes of prices in particular to note. Jobbers are somewhat inclined to cut on this, that, or the other, as they happen to take a notion, but are gaining nothing by it, as the merchants simply will not buy

until they actually are in need of the goods. The man who is on the ground then gets the business. The outlook for the future is good. The collections are fair.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—There is no improvement to report in our crop outlook. We have never experienced a crop failure in this section, but in a large territory immediately tributary to us we have come nearer to it this year than ever before. In another direction, wherein the past crops have not been so sure, they have a large yield. The low prices prevailing and a light crop do not tend to stimulate trade. Another handicap is the fact that so many lines of goods are being held above parity as compared with present price of steel and some steel products close to the raw material. The sooner the manufacturers meet the conditions now in existence and level up, or, rather, down, the sooner business will resume its normal course. The jobber only buys what is absolutely necessary for present wants. The retailer follows suit and the consumer is waiting events. We cannot advise any one to anticipate beyond immediate requirements, as we will not ourselves.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—At this writing trade is not as good as it was at the same time last year, but we think we can see a little improvement. We have had so much rain in this section that there has been very little wheat put on the market as yet, and our fall trade never opens up until the wheat is marketed. The mining of phosphate has been interfered with considerably by the continuous rain, also by lack of vessels to transport the phosphate to foreign countries. These causes, together with the fact that the market for pig iron has been declining and the Hardware market very weak, have caused the fall trade to open up slowly.

As we have an unusually large crop of wheat, which is just now beginning to be placed on the market, we confidently predict that the next 30 days will bring us good trade. We are experiencing an unusually warm spell of weather in this section, which has created a strong demand for some classes of goods, such as Refrigerators, Ice Cream Freezers, Lawn Swings, Hammocks, &c. People complain more of the prices of Wire and Nails than of any other article. We think a reasonable reduction in prices of these lines would have a wholesome effect upon the Hardware market.

Notes on Prices.

Wire Nails.—Orders for Wire Nails continue to be for small lots, with possibly a slight increase in the demand. The contrast between the conditions ruling a year ago and those of the present time is marked, as then the demand was quite unusual for the season. Prices are without change, as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots	$2.20
To jobbers in less than carload lots	2.25
To retailers in carload lots	2.30
To retailers in less than carload lots	2.40

New York.—The comparatively limited delivery of Wire Nails at this point direct from mill is resulting in an increase in the purchase of small lots from store. Some irregularity in quotations of Wire Nails in this market is attributed to small makers, which it is understood is not being met by jobbers. Quotations are as follows:

To retailers, carloads on dock	$2.48
Small lots from store	$2.55 to $2.60

Chicago, by Telegraph.—Makers of Wire Nails report that August, from appearances during the first two weeks, will be one of the best months of the year. Dealers' stocks are quite generally run down, and yet the buying represents only early wants, for merchants are not ordering in quantities larger than before. But there is great urgency requested in shipping, and orders by telegraph are more common. Prices are unchanged at $2.43 for carloads and $2.50 for small lots from store.

St. Louis.—Buying of Wire Nails continues in a small way, with no marked change from recent weeks. Some cutting is reported on the part of jobbers, but others say it is not more than was done in the past. The quotable price to retailers in carloads is $2.45, base; $2.55, base, for smaller quantities.

Cut Nails.—The movement of Cut Nails continues light, orders being for small quantities. The market is not regarded as an especially strong one. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, 2 per cent. off in 10 days:

Carload lots	$1.95
To jobbers in less than carload lots	2.00
To retailers in less than carload lots	2.10

New York.—No change has taken place in the local conditions of the Cut Nail market. Demand continues moderate and for small lots. Quotations are as follows:

To jobbers in carload lots on dock	$2.13
To jobbers in less than carload lots on dock	2.18
To retailers in less than carload lots on dock	2.31
Small lots from store	$2.25 to 2.30

Chicago, by Telegraph.—Trade in Cut Nails is reported fair. Prices are steady, $2.25 being minimum price in small lots from store.

St. Louis.—On certain sizes the demand shows an increase. Otherwise transactions are normal. Price remains at $2.30, base, out of stock.

Barb Wire.—The volume of business in Barb Wire continues light. Quotations for domestic trade are as follows, f.o.b. Pittsburgh, net cash 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted	$2.50
To jobbers in carload lots, Galvanized	2.80
To jobbers in less than carload lots, Painted	2.55
To jobbers in less than carload lots, Galvanized	2.85
To retailers in carload lots, Painted	2.60
To retailers in carload lots, Galvanized	2.90
To retailers in less than carload lots, Painted	2.70
To retailers in less than carload lots, Galvanized	3.00

Ellwood and Baker Wire is 5 cents and Washburn & Moen Glidden 10 cents per 100 higher than the foregoing prices.

Chicago, by Telegraph.—For all kinds of Wire the demand is better. While prices are unchanged, the feeling is said to be firmer in tone than for some time past, due to the most excellent inquiry. Business consists mainly of the small orders. Quotations for small lots, Chicago delivery, are $2.40 for Plain Annealed, $2.75 for Painted Barb and $3.10 for Galvanized Barb Wire.

St. Louis.—No extensive shipments have been made as yet, but the outlook for agricultural trade is excellent. Some slight irregularity is said to exist as to prices. Quotable prices remain at $2.75 for Painted in carload lots; $2.85 for smaller quantities. Galvanized is quoted 30 cents above the foregoing figures.

Plain Wire.—Demand for Plain continues light. The conditions of the market are unchanged. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes. Plain.	Galv.
To jobbers in carload lots	$2.15	$2.55
To jobbers in less than carload lots	2.20	2.60
To retailers in carload lots	2.25	2.65
To retailers in less than carload lots	2.35	2.75

The above prices are for the base numbers, 6 to 9. The other numbers of Plain Wire and Galvanized Wire take the advances indicated in the following table:

Plain Fence Wire Advances (Catch Weights).

Nos.					Galvanized.
6 to 9	Base				$0.40 extra.
10	$0.05	advance	over	base	.40 "
11	.10	"	"	"	.40 "
12 and 12½	.15	"	"	"	.40 "
13	.25	"	"	"	.40 "
14	.35	"	"	"	.40 "
15	.45	"	"	"	.75 "
16	.55	"	"	"	.75 "
17	.70	"	"	"	1.00 "
18	.85	"	"	"	1.00 "

For even weight bundles, 50 pounds and over, 5 cents per bundle advance on above.

Cordage.—Unevenness in Rope quotations by different manufacturers continues. Manila Rope, on the basis of 7-16-inch and larger for carload lots, ranges in price from 10¼ to 10½ cents per pound, while small lots are quoted more uniformly at 10¾ cents. Sisal Rope is quoted at 6¾ to 7 cents for carload lots and from 7 to 7½ cents for small lots by different makers. Merchants see no inducement in providing for more than immediate necessities on a declining market and demand is only fair.

Chain.—A reduction in price has been made by the manufacturers of Coil Chain. Present prices for cask lots, f.o.b. Pittsburgh, are as follows:

Inch	3-16	¼	5-16	⅜	7-16	½	9-16
Cents per pound	7.25	5.35	4.35	3.50	3.35	3.25	3.15
Inch			⅝	11-16	¾	13-16	to 1¼
Cents per pound			3.10	3.05	3.05	3.00	

Glass.—Orders have been given by the American Window Glass Company to have fires lighted in their factories, so that blowing of Glass can be begun September 1. It is understood that arrangements with the flatteners have been made, so that an agreement as to wages will be reached before that time. An association of the independent Window Glass manufacturers has been formed, the purpose of which, it is reported, is to fix prices of product and to control such other matters as will regulate the trade. Quotations are as follows:

Carloads from Factory.

Single strength:
- First bracket....85 and 10 %
- Second and third brackets....85 and 15 %
- All above....90 and 5 %

Double strength:
- First five brackets....89 %
- 60-inch bracket....90 %
- 70 and 100 inch brackets, inclusive..90 and 10 and 5 %
- All above....90 and 20 %

Eastern Jobbers, Less than Carload Lots.

Single strength:
- First bracket....80 and 10 and 5 %
- Second and third brackets....85 %
- All above....85 and 20 %

Double strength:
- First bracket....85 %
- Second, third, fourth, fifth and sixth....85 and 10 %
- All above....85 and 20 %

Western Jobbers, Less than Carload Lots.

Single strength:
- First bracket....80 and 20 %
- Second and third brackets....85 %
- All above....85 and 20 %

Double strength:
- First five brackets....85 and 10 %
- Sixth bracket....85 and 20 %
- All above....85 and 25 %

Ten per cent. extra for single strength, A A.

Freight equalized with nearest jobbing center.

Paints and Colors.—*Leads.*—There is a moderate business doing in White Lead in Oil, with prices unchanged. The weather during the past week has not been favorable for active outdoor work, and stocks in retailers' hands have been equal to demands. Quotations are as follows: In lots of 500 pounds and over, 6 cents per pound; in lots of less than 500 pounds, 6½ cents per pound.

Oils.—*Linseed Oil.*—Spot business in Linseed Oil represents the transactions for the past week. These were small, and were limited to immediate requirements. Crushers are not accepting bids from customers for future delivery of Oil. Flax Seed is coming into market from the Southwest in more liberal quantities than at the same period last season. Prices remain unchanged for City Raw Oil at 67 to 69 cents per gallon in lots of five barrels or more, according to make; with the additional charge of 1 cent per gallon in lots of less than five barrels. Western and State brands are held at 65 cents in lots of five barrels or more.

Spirits Turpentine.—The Turpentine market at this point has not shown much activity, and prices rule 1 cent lower than last week, now being quoted at 42 cents per gallon for Southerns and 42½ cents for machines. It is possible that prices may be higher when exporters at the South come into the market to fill August contracts. In this market demand is limited.

"Lest You Forget!"

THE tendency of the times to eliminate friendship as a factor in trade is greatly regretted by most of the men connected with the Hardware business and vigorously opposed by a few. Among these latter is D. W. Simpson, president of the Wilcox Mfg. Company, Aurora, Ill., and a veteran of the road, who in his peregrinations has gained many warm friends among his business associates. A short time ago Mr. Simpson distributed among his friends 1000 albums containing portraits of prominent men connected with the Hardware trade of the country, the cover bearing the suggestive legend, "Lest You Forget!" a sentence which Mr. Simpson's Boston friends turned to account in the following manner upon his recent visit to that city:

TO
DANIEL WEBSTER SIMPSON,
FROM
CERTAIN AMONG HIS MANY BOSTON FRIENDS—
Greeting!

Meshed in the snare of busy life,
Worn with its daily care and fret,
'Tis well, at times, that we should pause—
Lest we forget!
Lest we forget!

We pause to-day. Forgetting trade
And all its troubles, we have met
To give a thought to Auld Lang Syne—
Lest we forget!
Lest we forget!

We meet to send our greeting warm
To you, who ne'er have failed us yet;
Whereof a token, too, we send,
Lest you forget!
Lest you forget!

The token referred to is a gold headed cane, beautifully chased and inscribed:

From Your Boston Friends,
1900.
Daniel W. Simpson.
"Lest You Forget!"

Requests for Catalogues, &c.

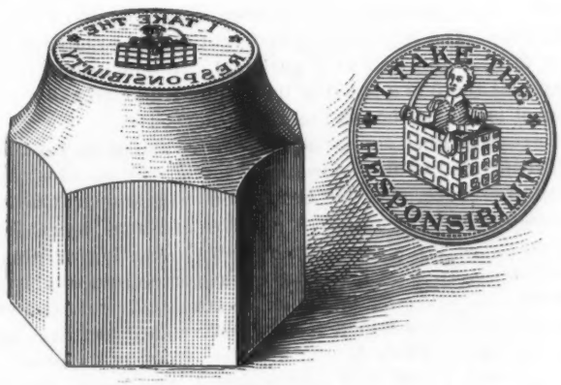
THE NEW BURRELL-JOHNSON IRON COMPANY have purchased the plant of the old Burrell-Johnson Iron Company, Yarmouth, N. S., and will operate it as heretofore. The company manufacture Marine and Mill Machinery, Stoves and Hollow Ware, and will be pleased to receive catalogues and price-lists from firms having goods that they require in their line.

J. G. Wells, who has recently bought out the Hardware business of L. F. Peacock & Co., Bloomsburg, Pa., requests from the trade copies of catalogues and price-lists relating to General Hardware, Sporting Goods, Paints, Oils, &c.

Sanford Hardware Company, Sanford, N. C., have incorporated, with a capital of $3000. The company's business is of a retail character and comprises Shelf and Heavy Hardware, Stoves and Tinware, Farming Implements, Sporting Goods, &c. They are now at work on a new brick building, 30 x 70 feet in dimensions, which will be occupied on completion.

A Historic Paper Weight.

THE accompanying illustration of a steel die used for minting coins is the property of J. G. Miller, secretary of the De Witt Wire Cloth Company, 17 Warren street, New York, and has been used by him on his desk as a paper weight for 35 years. Its discovery brought out some facts which may be of interest. The engraving was designed to symbolize the contest between President Andrew Jackson and the old United States Bank of Philadelphia in 1832, and represents him in a warlike attitude. The expression, "I take the responsibility," attributed to him arose out of the controversy concerning a dispute between the national administration and that bank. This die was used for striking copper pennies, the work being done by what is now the De Witt Wire Cloth Company, Belleville, N. J. In this connection we may say that similar coins for foreign governments and "tokens" in the form of coin for private business houses was also a part of the company's business at intervals in the 30's and 40's, the coins being principally for governments in South and Central America and the West Indies, among them being Brazil, Haiti, and even Liberia in Africa, while the "tokens" appear to have been issued in time of war when pennies and small coins were scarce and there was a demand for change, being put out for



Views of Die and Penny, Actual Size

the convenience of customers and afterward redeemed by those who issued them. It will be remembered that in the immediate vicinity of this factory there were copper mines which were worked until the price of copper got so low that the enterprise no longer paid.

The predecessors of this company began the manufacture of Copper Wire about 1836. The first Fourdrinier Wires made in this country were produced at this factory in 1847. They also manufactured the Wire used by Samuel F. B. Morse in his experimental telegraph line erected between Washington and Baltimore. Mr. Morse secured an appropriation from Congress in 1843 to defray the cost of this line, which was completed and operated about the middle of 1844. Copper Wire was then and for some time afterward exclusively used for telegraph purposes. This business passed from William Stephens & Sons to Gasherie De Witt in 1857; from 1861 to 1866 it was G. De Witt & Bro., from 1866 to 1876 G. De Witt, Bro. & Co. On January 1, 1876, the business was incorporated as the De Witt Wire Cloth Company, which they still remain. Cornelius Van Houten, now treasurer of the De Witt Wire Cloth Company, has been for 53 years connnected with the company, having been superintendent for about 40 years.

From this retrospect it will be seen that the field covered by the operations of the company has materially extended in the course of years, beginning with the working of copper in various ways and developing until they now include the diversified and important lines of Wire Rope, Cables, Sash Cord, Brass, Copper and Iron Wire Cloth, and Brass, Copper, Iron and German Silver Wire. The works are built on what was formerly the site of a powder mill, which was wrecked by an explosion April 30, 1814. The company have also a factory and warehouse in Philadelphia.

Export Trade.

Business with Porto Rico.

IN conversation with the chief of the Porto Rican department in a large export house in New York, who lived 12 years on that island, the following facts were obtained, which, in view of the possibilities of this market in the future, although not large now, are of interest to manufacturers here. The climate is referred to as exceptionally good, there being scarcely any of the liability to fevers, malaria, &c., incident to Cuba, as the ground is much higher and free from swamp and marsh. It is said that in the warmer portion of the year almost any desirable climate can be obtained by going back into the mountains short distances.

Prior to the inauguration of the tariff law for Porto Rico by the American Congress last winter, which is only 15 per cent. of the Dingley tariff in force in the United States, business was very bad, owing to the expectancy and long delay necessary to bring the matter to a focus, which naturally stagnated business. On the establishment of this form of duty the merchants were thoroughly pleased, and arrangements were made for resuming business on the old scale. However, since then, a number of incidents have served to handicap trade with the United States.

Porto Rico naturally looked to the United States for an open market for one of its chief products, tobacco, and a number of influential firms had in anticipation accumulated stocks of tobacco, expecting to make money out of it. As events shaped themselves it resulted in no market for this commodity here, and until such time as Porto Rico prepares leaf tobacco, as well as cigars, in the same way as Cuba, Porto Rico will suffer for want of a market for that product.

The obstacles to trade from the merchants' standpoint come from errors in the administration of affairs in the civil government newly inaugurated, and through what are considered as despotic regulations, customs laws, &c., all of which create friction to such an extent that the leading merchants there are meditating the advisability of a forcible protest, which it is proposed shall take the form of a general closing of their places of business for a stated period, possibly a week or two. It is hoped in this way to bring the question directly to the notice of the Washington authorities. It is admitted that some of the errors were bound to occur, and in due time will be satisfactorily adjusted, and it is said that an American administration of affairs will in the future be a great benefit to the island. The principal crops of Porto Rico are sugar, molasses, coffee and tobacco.

One reason why the merchants there like the tariff is that if a revenue was not raised in this way it would be levied in the form of an internal tax, which they say would cause friction and be more difficult to collect.

It seems to be taken for granted by manufacturers in the United States that this market is not large enough to warrant any change in their method of doing business with that country, but some idea of the possibilities there is given by recent figures, which show that exports from the United States to Porto Rico in May and June, 1900, were 140 per cent. more than in the corresponding months of 1899, while imports from Porto Rico to this country for the same periods were nearly 60 per cent. greater.

Growth of Commerce with Our New Possessions.

The figures given below are interesting, as showing the remarkable growth of commerce between the United States and our new possessions since 1898. The reports of the Treasury Bureau of Statistics show that during the two months in which the new tariff act referred to above between the United States and Porto Rico has been effective (since May 1), there were great in-

creases over that of the corresponding two months of the preceding year. This is the more observable because of the assertion frequently made during the past few months that Porto Rico is practically impoverished as a result of the tropical storm of August last. Notwithstanding the conditions due to the storm, both as to material for exportation and purchasing facilities, the exports to the United States in May and June, 1900, were about 60 per cent. in excess of those of the corresponding months of 1899, and the imports from the United States were almost one and a half times greater than those of the same months in 1899. In May and June, 1899, the imports into the United States from Porto Rico were $1,461,998, and in May and June, 1900, were $2,322,124. In May and June, 1899, the exports to Porto Rico from the United States were $666,987, and in May and June, 1900, they were $1,587,478.

The total exports to Cuba, Porto Rico, Hawaiian Islands, Philippine Islands, Samoa and Guam for three years are as follows:

Fiscal Years Ending June 30.

Exports to—	1898.	1899.	1900.
Cuba	$9,561,656	$18,616,377	$26,513,613
Porto Rico	1,505,946	2,685,848	4,640,430
Hawaiian Islands	5,907,155	9,305,470	13,509,449
Philippine Islands	127,804	404,193	2,640,449
Samoan Islands	39,982	56,522	146,267
Guam	4,070	6,883	13,247
Totals	$17,146,613	$31,075,293	$47,463,455

The following table shows the principal exports to Cuba, Porto Rico, Hawaii and the Philippine Islands during the fiscal year 1900:

Articles.	Cuba.	Porto Rico.	Hawaii.	Philippines.
Iron and Steel mfrs.	$3,717,127	$579,505	$4,064,306	$383,892
Wood, mfrs. of	2,122,553	368,985	1,314,957	84,127
Coal and Coke	738,614	53,960	119,628	142,793
Oils, mineral	484,984	99,296	227,680	7,774
Leather, mfrs. of	340,570	38,788	307,270	32,341
Cars and Carriages	253,622	21,175	70,389	24,197
Scientific Instruments	218,307	32,392	115,827	13,112
Agricultural Imp'm'ts	175,816	7,389	12,628	1,725
Glass and Glassware	158,474	14,412	51,311	6,012
Copper, mfrs. of	111,860	8,042	18,300	57
Furniture, metal	76,135	2,308	5,858	....
India Rubber	73,765	7,092	66,120	4,936
Bricks	62,041	....	51,280	....
Naval Stores	59,298	6,096	6,729	671
Lamps, &c.	54,994	6,174	25,475	4,974
Clocks and Watches	23,848	649	18,627	19,014

Such important classes as provisions, breadstuffs, animals, vegetables, cotton manufactures, &c., aggregating millions of dollars, we take no note of, giving mainly the classifications likely to interest our readers.

Latin-American Trade.

To illustrate the advisability of making concessions to the wants, necessities, or even prejudices, of the Latin speaking nations south of us for the expansion of trade, we will call attention to a circumstance of comparatively recent date.

In some of the West Indian islands they have been accustomed to using certain metal goods for building purposes. Heretofore they have imported from Europe plates of certain styles and sizes, which in the end were not as desirable and economical as those made in this country; however, to get acquainted with the buyers and establish business connections it was decided to duplicate goods they were familiar with and knew all about. After a while the styles peculiar to us were worked in gradually, until now they are sent almost altogether, and usually preferred wherever the consumer has an opportunity to test comparative values. It is observed that it is easier for the young Spanish clerk to sell what he has been accustomed to than to educate the people to something else. The main thing is to get acquainted with the merchants and open accounts, after which our standards, sizes, styles and kinds of goods can be worked in gradually to our mutual advantage. Some of the same goods were introduced into Santiago some time ago through the medium of the United States Government Quartermaster. From that time on it was much easier to sell the merchants.

Current Business Conditions in Cuba.

There recently came to our notice a communication from the Havana (American) representative of a New England manufacturing company concerning present conditions in Cuba. It was of a very discouraging nature, the principal features referring to the withdrawal of American troops, the contemplated elections for the choice of a government in the near future, and the virtual turning over of the government to the natives this fall. As a result of these conditions the correspondent said that business was at a standstill, some merchants were selling out at a great sacrifice, and many others were desirous of so doing. We might add the representative was new to the company, and had been there but a short time.

Inquiry among some of the leading export houses trading with that country seems to contradict the conclusions of this correspondent. One of them doing an enormous export business all over the world, and a particularly good business with Cuba, say they have shipped more goods to that country this year than ever before; that the June volume of trade was double that of January last. July business is referred to as rather slack, August, however, so far is keeping up an excellent average. They say that there is every indication that this year's crop (principally sugar and tobacco) will be a good one. Last year's crop of sugar cane was largely used as seed for this year's crop, which is believed to be much greater in acreage. The largest crop of sugar Cuba has produced is given as about 1,120,000 tons in 1894. This year's crop, it is thought, will be about 500,000 tons. The tobacco crop last year is said to have been the largest and best ever gathered. In conclusion, they say that there is a steadily increasing trade, and that today it is one of the best markets they have.

From another source equally good, so far as contact with the merchants there and opportunities for observation are concerned, the head of a well-known Cuban house in New York, himself a native of Cuba, says there is no cause for alarm whatever with existing or prospective conditions. The letter of the correspondent above alluded to being read by him, he laughingly told one of their experiences which seemed to have a direct bearing on the case. Early in the nineties, when a reciprocity treaty with Brazil was contemplated, this house, thinking to take advantage of a good opening for a new market, dispatched a representative to one of the large coast cities of Brazil, to go over the ground, get acquainted with the merchants and buyers and generally size up the situation, this venture being started about six months before the treaty was expected to go into operation. Arrived in Brazil, the representative visited some of the houses, saw some soldiers on the street, heard more or less of a coming revolution, and, without advising his principals, packed his belongings and sailed away for Buenos Ayres. To cut the story short, about the same conditions, including soldiers, revolutions, &c., developed there, and before the house in New York knew it or could advise him he was on his way back.

It is generally agreed in the trade that it is difficult for new men, unaccustomed to Spanish ways and customs, without any acquaintance with the house they are seeking to interest, to do business. Spaniards are very conservative in establishing new dealings. Another difficulty is the lack of knowledge as to what is required for that market, accustomed as they are to English, German and French salesmen, who for a long time have catered to their idiosyncrasies and peculiarities in regard to kinds and styles of goods, method of packing, arrangement of credits, &c. These things are referred to as the main difficulties in opening up new business in South and Central America and the Gulf Islands.

C. E. Wood has succeeded Wood & Co. in the general Hardware and Miners' Supply business in Carterville, Mo.

T. W. Hauser has purchased the Hardware, Stove and Sporting Goods business of W. H. Thurston at Ames, Iowa.

A Felicitous Occasion.

FRANK L. BROWN, formerly Pacific Coast sales agent and manager for the American Steel & Wire Company, a short time since resigned from that position to accept a position as general sales agent for the Shelby Steel Tube Company, with headquarters in Chicago. Before his departure from San Francisco a number of his friends in business circles gave a banquet in his honor at the Cosmos Club, Friday evening, 3d inst. There were present about 30 persons. During the progress of the banquet Mr. Brown was presented with a beautiful silver punch bowl as a token of regard from his friends in the iron and metal trade. A. A. Watkins, president of the San Francisco Board of Trade, who is also a member of the Executive Committee of the Pacific Coast Hardware and Metal Association, made the presentation speech, eulogizing the personal qualities and business qualifications of Mr. Brown in high terms. Mr. Brown was quite overcome with surprise, but responded briefly, feelingly expressing his gratitude. Mr. Brown has been at all times an enthusiastic worker for the interests of the Pacific Coast, and especially of his home city, San Francisco. He has had wide experience in business on the Pacific Coast, having lived there for upward of 20 years, first being in business at Portland and during the last seven or eight years in San Francisco. For several years he has had charge of the store and works of the Washburn & Moen Mfg. Company, and later on, when this concern were merged into the American Steel & Wire Company, Mr. Brown was selected by them as their manager.

FRANK L. BROWN.

He had also served efficiently as secretary of the Pacific Coast Hardware and Metal Association.

The banquet to Mr. Brown was also made the occasion of another very pleasant affair. The members of the Pacific Coast Hardware and Metal Association took advantage of the occasion to present to Brace Hayden a token of their esteem for him and his services rendered to the association in his connection with it as president during the past two years, Mr. Hayden having declined re-election at the expiration of the year ending June last. Mr. Hayden is president of the Dunham, Carrigan & Hayden Company and is also one of the vice-presidents of the National Hardware Association of the United States. The sentiments of the friends and members of the Hardware association were expressed in the form of a beautiful solid silver loving cup of large dimensions. The presentation speech, as in the case of Mr. Brown, was made by Mr. Watkins, a member of the Executive Committee, who accomplished the task in his masterly

BRACE HAYDEN.

and inimitable style. Mr. Hayden responded in words which indicated his deep feeling of gratitude for the friendship shown him by the association.

Outing of the Albany Hardware & Iron Company.

THE second annual outing of the Albany Hardware & Iron Company, Albany, N. Y., was held on the 11th inst. It was thoroughly enjoyed by a party consisting of about 60 persons. The trip was to the Wayside Inn, which proved a happy selection. The officers of the company, in direct charge of the gathering, were indefatigable during the afternoon and evening in their efforts to give the "boys" a good time.

The stores of the company were closed at noon, and shortly after the party were on their way to the charming rendezvous which had been chosen. The trip through the country was a delightful one. An attractive dinner was served on arrival at the Inn, at the end of which Chas. H. Turner, president of the concern, rapped the company to order and spoke in a most felicitous manner, complimenting the employees on their faithfulness to the company's interests. In appropriate words he then presented a handsomely framed etching to the veteran James O. Hovey in token of his sterling worth and long service with the company. Mr. Turner also presented a purse to Philip Powers, whose marriage was to take place two days later. Secretary W. B. Wackerhagen also addressed the gathering. After dinner the party adjourned to the ball field, where teams from the main and branch stores contested for supremacy. Later a tug of war match took place. Luncheon was then served, and an hour later the party started on their homeward trip, which occupied two hours, every one much gratified with the success which had attended their second annual outing.

Packard Bros. have purchased the Hardware, Stove and Agricultural Implement business formerly carried on by G. Fred. Schafer at 500-508 North Salina street, Syracuse, N. Y., and will continue at the old stand. The business is both wholesale and retail.

Cultivating Australian Trade.

FROM AN AUSTRALIAN CORRESPONDENT.

SOME few months ago this correspondent endeavored to point out, for the benefit of American traders, a few facts and methods of working which might be of use to them in extending or obtaining an Australian market. Much is yet to be done, and the obtuseness displayed by firms on your side, who really ought to know better, is something to marvel at. For instance:

ONE WAY OF SAMPLING.—A leading firm of Tool manufacturers in your country recently appointed as their Australian representatives a smart firm of agents here. Samples, exquisite specimens, were sent out and duly arrived. But there are two ways (at least) of sending out samples, although there is only one proper way. One of the foolish ways of sending them was adopted, and they arrived here unmarked, unnumbered and unpriced. One (only) small catalogue accompanied them, and the goods have to be classified, discounts reckoned out, marked and labeled by a perspiring and profane clerk, the while the business stands still.

WHERE CARE IS NECESSARY.—It seems childish to have to indicate to experienced men of business that the only proper way is the simplest way of all. The company in question turn out good goods, judging by their samples, and their technical ability is self evident. Brains are employed in their factory; why not have them employed in their warehouse and office?

DIFFICULTIES TO OVERCOME.—They have decided to attempt to get a share of Australian trade, and to do this they have to enter into competition with the best makers of Sheffield, firms who have been ably represented here for years and have intelligently studied Australian requirements.

COMPLIMENTS FOR US.—Do your American makers consider that Australia is a land of bark huts and galvanized iron shanties, inhabited by a pioneer class who have as yet barely cleared the forest lands and subdued the blacks?

Let me assure them those days are far behind. This is a progressive and perfectly civilized community, and a community the Steel and Edge Tool trade of which is critical to the highest degree, as the result of long years of pampered attention from Sheffield makers.

Having been pardoned this slight divergence from the actual personal matter under discussion, let me return to the position of the firm with the samples ready to leave their factory and subdue the folks "down under."

THE FIN-DE-SIECLE WAY.—Before dispatch each sample should have a neat label attached showing prices (and discounts where advisable) in private marks for the agents' guidance. An experienced clerk could do this to a full range of samples in half a day at most, and the same experienced clerk would naturally think, "How about catalogues?"

CONCERNING A SUPPLY OF CATALOGUES.—Can you, Mr. Editor, conceive the utter folly of attempting to work a huge market without a catalogue, or with only one or two?

Imagine a buyer coming into the showroom (and you thousands of miles from headquarters). He is impressed with the goods, prices are all right, &c., and the almost invariable thing is, "Yes, I think they'll do; give me a catalogue and I'll make up an order for you after I've found out exactly what I am in most need of." Then imagine yourself making lame excuses, or perhaps lending him the only one you possess, with your heart in your boots because of the sure and certain knowledge that he will lose the list or forget to return it, and you will be left with your hands tied, samples littering your showroom, your American principals asking why they don't get any business and too stupid to see it is their own fault.

AUSTRALIA AS BIG AS THE UNITED STATES.—Or suppose, in this country of big distances, quite equal to those of the United States, and without the latter's facilities of transit, that a firm in Queensland or Western Australia, too distant for a personal call, except, perhaps, once a year, write for a catalogue. Is it to be supposed they will hold their order to oblige you while you write home for a list, and Sheffield travelers always at the door?

A PLACE FOR THE CATALOGUE.—Catalogues, catalogues, catalogues, let me iterate and reiterate their necessity. And they must be high class productions. Goods well shown are half sold, and it is a false economy—it is more, it is a criminal neglect of golden opportunities of trade—to spend $500 on a middle class production when $700 will give a high class one. Your country can excel in the art of printing, and some few of your manufacturers take advantage of it, but I grieve to say that the bulk of the lists which reach these shores do not compare in point of excellence with the British ones. Let your manufacturers lay this fact to heart, that 300 catalogues are not too many to place in the hands of Australian agents if they wish to help these latter to work up a connection for them. For convenience of size and for posting, &c., it is preferable to have them no larger than, say about the size of *The Iron Age*, 12 inches or so by 9 inches.

Small lists of the 3 x 2 inch size, which many of your traders favor, are too liable to be lost and do not impress Australians with the importance of your firms—a small matter, perhaps, but all these small matters are worth consideration as helping to build larger trade.

UNMARKED SAMPLES.—Another Hardware firm on your side recently sent out an unmarked range of samples, with two much mutilated lists, instructions to ignore the one list, while the second list was not arranged in accordance with the first.

Fancy the joy of arranging and marking the goods.

HOW NOT TO DO IT.—Now, in conclusion, let me give one more instance of absolute fact, although so wildly absurd as to be hardly credible.

An American firm with a wild yearning for Australian business recently appointed agents here to work up a connection and sent a full range of samples, unaccompanied by any invoice, letter of advice or catalogue.

Imagine sending goods even to the next town without an invoice.

Can you believe it? It is solemn truth. Result: the bulk of the goods are in the Queen's warehouse, accumulating charges, as the agent representing them has something better to do with his time than waste it at the customs house while each separate article is examined, wrangled over and assessed for duty by the port officers.

The foregoing remarks will, I trust, be of some small service to your traders. "How not to do it" appears to be their aim, all through lack of a little forethought.

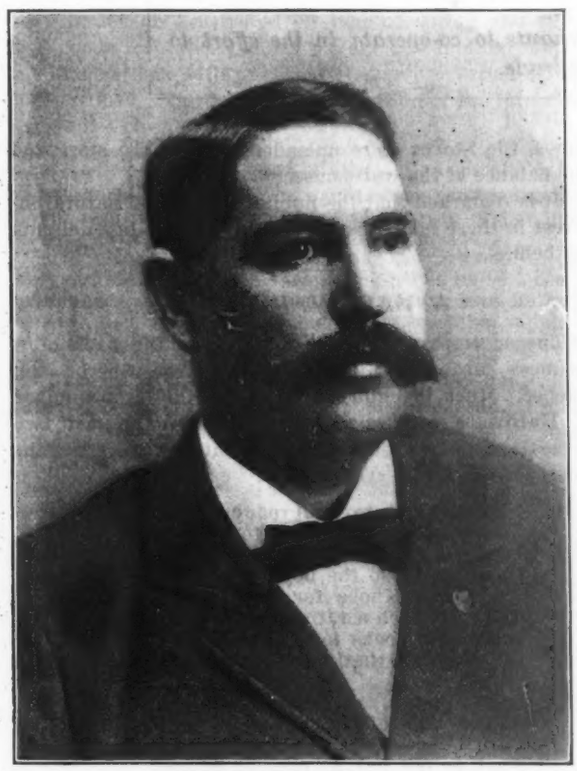
A BRIGHTER SIDE.—It is some small pleasure to know that the above cases are not the usual rule, and perhaps this pointing out of small deficiencies may serve to prevent their repetition even in a single case, and thus assist your traders to further develop their Australian interests and add to their profits.

Stanley Rule & Level Company's Catalogue.

STANLEY RULE & LEVEL COMPANY, New Britain, Conn., New York office, 107 Chambers street, have just issued Catalogue No. 26, which is essentially a mechanics' hand book, convenient for the pocket, of the company's Rules, Plumbs and Levels, Iron and Wooden Planes, Try Squares and Bevels, and miscellaneous improved Wood Workers' Tools. No prices are given in the book, the object in publishing it having been to present to the users of the company's Tools a hand book giving specifications of and information regarding certain of their Tools most generally used. The company have been engaged in the designing and manufacture of Carpenters' Tools since 1857 under the present name, while for several years previous to that time the same business was carried on under other names.

Indiana Retail Hardware Dealers' Association.

WE give herewith portrait of M. L. Corey, the new secretary of the Indiana Retail Hardware Dealers' Association, who was elected at their semiannual meeting at Indianapolis, to which reference was made



M. L. COREY,

The New Secretary of the Indiana Retail Hardware Dealers' Association.

in our last issue. Mr. Corey is the senior member of the firm of Corey & Stevens, Argos, Ind., and has been conspicuous in the work of the association from its inception. He is regarded as very well qualified for the position, and will doubtless discharge its duties with much credit to himself and the association.

We also present a group picture of the members of the Indiana organization. The photograph from which this illustration was prepared was taken by E. C. Atkins & Co. on the occasion of the visit of the members to their works.

Trade Items.

JOHN J. TEEPLE, who for nine years has been identified with the Van Wagoner & Williams Hardware Company, Cleveland and New York, has resigned his connection with that company to accept the position of assistant manager of the New York branch of the Peck, Stow & Wilcox Company. His duties will lead him largely into the same field as was formerly occupied by Winfield D. Walkley, who is now associated with another company.

DETROIT LEATHER GOODS MFG. COMPANY, Detroit, Mich., became incorporated August 1, with a capital of $10,000. The company make Leather Bicycle Grips, Automobile Handles and Leather Sundries. J. C. McIlroy is president and general manager.

S. R. DROESCHER, 79 Warren street, New York, has been made the Eastern representative of the Clyde Cutlery Company, Clyde, Ohio, for the sale of Butcher Knives and Pruning Shears manufactured by that company.

COL. J. R. NUTTING of the Sickels & Nutting Company, Davenport, Iowa, is regarded as having a good chance of being selected by Governor Shaw to fill the vacancy caused by the death of United States Senator Gear, for the term expiring in 1901. Colonel Nutting has always been a loyal Republican and has contributed liberally of his time and means to further the interests of that party.

PATTERSON, GOTTFRIED & HUNTER, 146-150 Centre street, New York, issue a card hanger, 11 x 4½ inches, in which attention is called to the Nicholson Great Western XF Files, for which they are selling agents. These Files are made in Swiss cuts and shapes.

FOR some time the Steel Ball manufacturers of the country have been endeavoring to form an association or combination for the control of output and prices. A meeting of manufacturers was held in Buffalo last Thursday, and from reports it is evident that the aims in the above direction have been successful. On Monday the Cleveland Ball & Screw Company and the Grant Ball Company, both of Cleveland, announced that their output for the coming season had been contracted for by the Central Distributing Company, with headquarters at 301 Mooney-Brisbane Building, Buffalo. E. A. Jones is sales manager for the company. The Cleveland concerns will be governed entirely by the Buffalo company as regards output and all sales will be made through the latter company. It is understood that the Steel Ball Company of Chicago and the Excelsior Ball Company of Buffalo have also made similar arrangements.

INCORRECT statements have been made in the daily press relative to changes in the Merchants' Wire & Nail Company of St. Louis, whose works are located at Granite City, Ill. We are advised that a change has simply been made in the management, but no other changes whatever have taken place, and the plant will continue to be operated as formerly. Clement M. Biddle retires from the active management on account of ill health, and is succeeded by D. C. Bergundthal, who was formerly in the wholesale Hardware business in Indianapolis.

MEMBERS OF THE INDIANA RETAIL HARDWARE DEALERS' ASSOCIATION.

Edgar Ford of Pittsfield, Mass., and Lyle B. Parker of Dalton have purchased the Hardware and Plumbing business of Frank W. Strong, Dalton, and will continue under the style of Ford & Parker.

Trade Winning Methods.

This department will contain a description of approved methods of bringing customers to the store by means of newspaper advertising, circulars and such special expedients and methods as are found useful by enterprising and progressive Hardwaremen.

A cordial invitation is extended to merchants to co-operate in the effort to make it suggestive and of practical use to the trade.

DOWNING THE CATALOGUE HOUSES.

An Indiana Method.

In a circular to his customers R. G. Crist of New Market, Ind., states, among other things, his position regarding catalogue houses, as follows:

I wish to say a word about catalogue houses and big advertisements you see in the papers: First, I will duplicate anything you may find in them, you to pay spot cash as you have to do with them and take the goods whether you like them or not. I keep these catalogues on my desk and with very few exceptions my prices are lower than theirs.

A Sewing Machine that I sell for $20 they sell for $22; you pay the freight. One that I sell for $24 they sell for $29.50; you pay the freight, and I think I have the best machine at last. I give you a 10 years' warrant on them and you take machine home, use it all you want to 90 days. Bring it home any day you do not think you have a bargain. I have them at all prices

This applies to all lines of goods you see in catalogues and big advertisements. Bring me the catalogue or advertisement; let us talk it over; if I cannot save you money I will frankly tell you so.

How an Illinois Merchant Does It

F. O. Dahlberg, who conducts the "Cash Hardware Store," at Toulon, Ill., writes that he believes he has solved the problem of how local Hardware dealers may meet catalogue house competition. Last year he issued a small catalogue, and was surprised at the increase in business.

A Larger Catalogue.--For the spring and summer of 1900 a larger catalogue was issued, known as the "Cash Hardware Store Index," which is distributed freely in the town and surrounding territory. This index is 8 x 10½ inches in size, and contains 133 pages. It is fully illustrated, with retail prices, and contains an alphabetical list of the goods to which it relates. The introduction to the index is largely taken up with an explanation why the "Cash Hardware Store" is able to make prices as low, and in many cases lower, than any catalogue house.

Willing to Help Others.—As the type and electrotypes are set up, the proprietor states he can furnish catalogues to any one desiring to try his plan, at considerably less than the original cost.

ANNUAL STOVE PARADE.

On May 12 last Samuel Gordon Ingle of San Diego, Cal., had his third annual all day brass band parade of Quick Meal Vapor and Oil Stoves. This represented, Mr. Ingle states, the largest shipment ever made of a similar class of goods to any retail merchant in the State, except one of the same amount a year ago to the same party.

The parade consisted of eight two-horse truck loads of Stoves, headed by a band wagon. The trucks all had banners, each one lettered differently and with much originality. The parade started at 9 o'clock, and continued marching until 4 in the afternoon, stopping an hour at noon. After radiating from the business center to the outskirts of the town and coming back by a different route, and going over the busiest streets several times, the Stoves were unloaded, part at the store and the balance at the warehouse.

It is remarked that the public take a good natural interest in these noisy displays and the small boy delights in them.

A HARDWARE POEM.

The accompanying poem appears on the back of a business card issued by James F. Kerr, Sherbrooke, Quebec. Much ingenuity is shown in the large number of Hardware articles introduced, while the last two verses are devoted to the disadvantages, to the merchant, of the credit system.

Hatchets and Axes all ready to chop,
Hoes and Rakes to care for the crop,
Rings and Ringers so hogs can't root,
Club Skates so the boys may scoot.
Locks and Knobs for store and house,
Traps to catch a rat or mouse,
Lines and Hooks to catch big fish
(At any rate that's the buyer's wish).

Saws, Planes, Augers and Bits,
(If they are soft he catches fits)
Barb Fence Wire, and Post Hole Diggers
That do not pay at present figures;
Brushes of all kinds, in quantity fair,
And Combs to curry the old gray mare.
Corn Cutters, also Scythes and Snaths,
And Wire fixin's to wean the calves.

Circular Saws that go with a buzz,
As Shurly and Dietrich always does.
Canada Mixed Paints, if you want to paint,
You open a can and it makes you faint;
Well Buckets, Ropes and high Step Ladders,
Fish Oil, Putty, put up in bladders,
Pure Coach Varnish without any gum,
Bell faced Hammers to pound your thumb.

Steel Ice Creepers so you can't slip,
Hollow ground Razors to shave your lip,
Rubber Hose all nozzled to squirt,
That will not burst and spoil your shirt,
Firmer Chisels, both tanged and socket,
English Knives to keep in your pocket;
Unadjustable Plumbs and Levels,
All kinds of Steel Squares, also Bevels.

Poultry Netting for the making of coops,
Jones' famous Shovels and Scoops;
Mincing Knives for chopping the hash,
Blanchard Churns that go with a dash,
Wrought Butts jointed fast and loose,
A 24-pound Tailor's Goose.
Columbia bicycles built for two,
Any other Cycle would never do.

Big Tin Horn with a Hardware toot;
All these things and many more
Are kept in my Hardware store.
I sell for cash and give a discount,
But sometimes sell on credit account,
With numerous slips on small Wire Hooks,
It runs this way for a number of years,
Until a man's mind is filled with fears

That some of his creditors would not wait
For farmers to sell their wheat so late.
The bailiffs also are very slow pay,
Most of them seem to be built that way;
So I'll avail myself of a cash per cent.,
This is the only way to make a cent,
So that what I have the Sheriff will resent,
To close my store this will prevent.

VARIOUS TRADE WINNING METHODS.

We describe below methods adopted by merchants to attract trade, some of them being referred to as very successful. They will doubtless be suggestive to those who are looking out for approved methods:

A Spring and Summer Circular.

The Carlton Hardware Company of Calumet, Mich., have issued an illustrated circular of spring and summer goods, containing eight pages. It contains numerous illustrations with prices on a large proportion of the goods named. The following is a portion of the introduction to the circular:

For several years this business has shown a wonderful growth in all departments, the sales have increased at an almost phenomenal rate. Our long experience has given us a better knowledge of the wants of our customers, whom we at all times strive to please.

All goods sold here shall be what they pretend to be; marked absolutely at the lowest point, but under no circumstances will our standards be permitted to be lowered. As in the past our customers will be supplied with the picked product of the most skilled manufacturers.

In trading here you take no chances, but get the most value for your honest dollar that can be found. With more deeds and fewer words we propose to keep bringinb trade to our store on strictly business lines, and with bargains whose money saving power can be definitely and practically illustrated.

Holiday Souvenir.

The Pease-Humphrey Hardware Company, West Superior, Wis., issued a handsomely printed pamphlet for distribution during the last holidays. It was printed in two colors, and gave illustrations and descriptions of Five O'clock Tea Kettles, Baking and Chafing Dishes, Tea and Coffee Pots, Carving Sets, Pocket Cutlery, Razors, Skates, Scroll Saws, Mechanics' and Carpenters' Tools, Air Rifles, Bicycles, Steel Ranges, &c.

The book was distributed freely and produced satisfactory results in an increased sale of holiday goods.

Effective Circulars.

Stahler Bros., who have Hardware stores at Waverly and Portsmouth, Ohio, and handle Hardware, Harness, Bicycles, Farm Implements, Carriages, Sewing Machines, Threshers, Saw Mills, &c., in the spring of last year sent out 4000 illustrated circulars, about 24 x 34 inches in size, showing many of these lines of goods and pricing a number of them.

The circulars proved a drawing card, and the firm advise us that they were many times repaid for the expense and labor entailed.

The names of parties to whom the circulars were sent were obtained by copying the name of each taxpayer from the county records. This list is revised each year.

Newspapers and Show Windows.

W. B. Miller & Son, Springfield, Ill., advise us that their experience with circulars, &c., has not been very satisfactory. They depend entirely on newspapers, in which they take liberal space, and on their show windows, to the displays in which particular attention is given.

Beall Bros.

BEALL BROS., Alton, Ill., have applied for final papers of incorporation. The capital stock named therein is $90,000. The officers will be Chas. B. Beall, president; Edmond Beall, vice-president and general manager; J. W. Beall, secretary and treasurer. These gentlemen constitute the present copartnership, which was entered into in 1879. The business, that of manufacturing Miners' Tools, was founded in 1865 by the present senior partner. The buildings at the old location were visited by fire in December, and steps were at once taken to purchase other property, the old plant in the meantime running in a limited way. The new plant covers an area of 275 feet square, and has been in active operation since March. Additional buildings were erected in which every convenience was embodied for quick manufacturing. Commendable attention was given to the comfort of the employees in providing ample ventilation and light. The liberal use of whitewash and paint both on interior and exterior of buildings, together with the extreme neatness of the floors in all shops, is especially to be commended. The company make all kinds of Coal, Lead, Zinc, Gold and Silver Miners' Tools, one of their specialties being the Alton Post and Grip Drilling Machines for drilling blasting holes in coal veins.

Price-Lists, Circulars, &c.

S. W. CARD MFG. COMPANY, Mansfield, Mass.: Taps, Dies, Screw Plates, &c. An illustrated catalogue and price-list issued, including the above named and kindred goods, cancels all previous editions. A pocket edition of the catalogue is also issued, containing the same matter.

E. C. ATKINS & Co., Indianapolis, Ind.: "Some points about the Atkins Hand Saws." A pamphlet illustrates in colors, with descriptions, this line of Saws.

LANE BROS. COMPANY, Poughkeepsie, N. Y.: Hardware Specialties. Catalogue No. 16 is devoted to Door Hangers, Sliding Door Latches, Stay Rollers, Fire Door Fixtures, Store Ladders, Lock Tackle Blocks, Carriage Jacks, Coffee, Spice, Drug, &c., Mills.

WHITING MFG. COMPANY, Northboro, Mass.: Cash Registers. A catalogue issued contains illustrations and descriptions of Cash Registers. This is accompanied by an export supplement, showing Registers adapted to the English currency.

EMMERT HARTZELL, Fairfield, Pa.: Hand Forged Butchers' Cutlery and Bread Knives. A pamphlet illustrates these goods, with prices.

INLAND STEEL COMPANY, Chicago, Ill.: Indestructible Posts for farms, railroads, lawns, hitching, cemeteries, grape arbors, &c. A pamphlet describes the base as made of vitrified clay, with angle steel set in the center of the base. The Posts are referred to as being as cheap as wooden posts.

BATES MFG. COMPANY, New York: Bates' Automatic Hand Numbering Machines. The company issue a large postal card illustrating and describing their Stamps.

Among the Hardware Trade.

Alford & Ruhmann have succeeded E. P. Ruhmann in the Hardware, Stove, Agricultural Implement, Sporting Goods, Furniture, Wagon and Buggy business in Kenedy, Texas. The new firm have materially enlarged the store, so that they are enabled to carry a larger line of goods than heretofore.

C. O. Dayton has purchased the Hardware, Stove and Sporting Goods business formerly conducted by M. J. Stewart & Co., Keota, Iowa. The new proprietor has entirely remodeled the store.

F. S. See & Son are successors to See & Thompson, Gem, Kan., dealers in Shelf Hardware, Tinware, Blacksmiths' Supplies, &c.

F. O. Melin has succeeded the old firm of Melin & Lindstrum, Essex, Iowa, dealers in Hardware and Farm Implements and Machinery.

Skirving & Son, Brownlee, Neb., have been succeeded by J. H. Skirving at the old stand.

About August 15 Robinson Hardware Company, Dublin, Ga., will take possession of their new building, a modern, up to date structure, two stories high, 40 feet wide by 125 feet in length.

Oren Stratton has bought the Hardware and Harness business of H. G. Seaman, Carthage, S. D., and has removed the stock into a larger and more commodious building.

Garwood Bros., formerly at Arborville, Neb., are now located in McCool Junction, Neb., having recently removed to that point.

London Hardware Company, Marietta, Texas, have lately moved into a new stone building, 25 x 120 feet.

Adams Hardware Company, Port Townsend, Wash., have purchased the business of Phillips & Henrickson of that city and added the goods to their large stock at 401 to 409 Water street. The Adams Company, who do a wholesale and retail business in Hardware, Stoves,

Farming Implements, Sporting Goods, &c., have lately added another room to their establishment, which now comprises five numbers, 401 to 409 Water street, a frontage of 75 feet, with warehouses in the rear.

The interest of R. W. Sadring in the firm of R. W. Sadring & Son, dealers in Hardware, Stoves and House Furnishing Goods, and workers in tin, copper and sheet iron, has been purchased by his son. The business will be continued at 4720 Easton avenue, St. Louis, under the name of John E. Sadring.

About July 1 Matt Stewart & Co., Memphis, Tenn., became Matt Stewart Hardware Company, a change in name only.

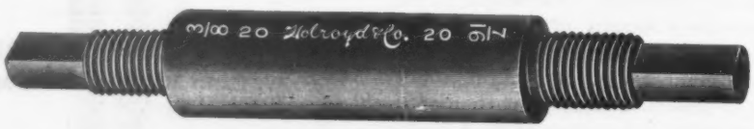
R. H. Flood has succeeded Flood & Calthorp in the Hardware, Farm Implement and Buggy business at Nacona, Texas.

Burrows Bros., Hardware merchants, Beeville, Texas, are erecting a warehouse, 24 x 50 feet in dimensions.

J. R. Bolen, Gainesville, Texas, will remove his stock of Shelf Hardware to Granite, O. T.

The Holroyd Bicycle Cone Mandrel.

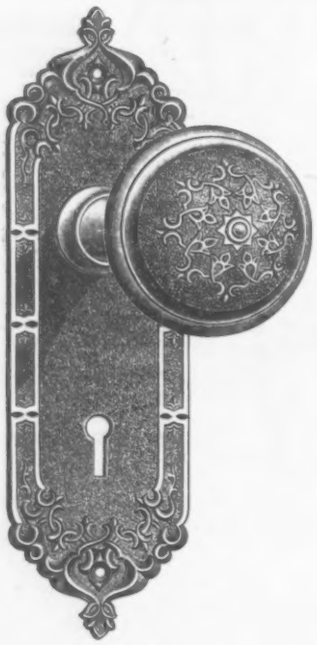
Holroyd & Co., Waterford, N. Y., are offering the bicycle cone mandrel shown herewith. The tool is a new one, and is intended for the use of bicycle repairers in making new cones and regrinding old ones. The mandrel is made in any combination of sizes and threads desired. Those catalogued are ¼ and 5-16, 18 to 32, inclusive, also ⅜ and 7-16, 18 to 32, inclusive.



The Holroyd Bicycle Cone Mandrel

Alcazar Design.

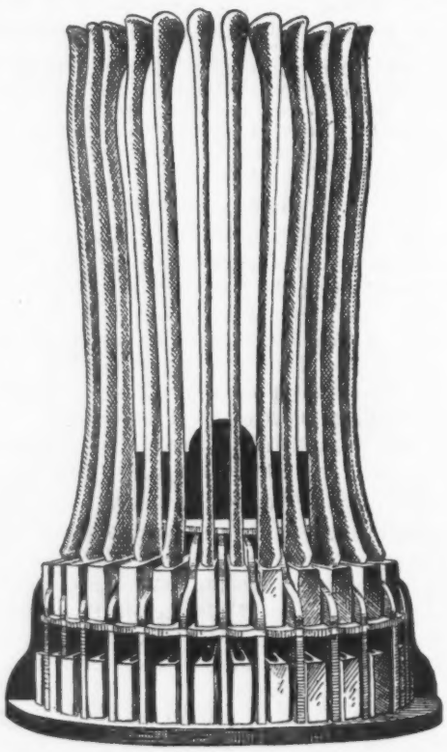
Russell & Erwin Mfg. Company, New Britain, Conn., and 43-47 Chambers street, New York, have just brought out the Alcazar Moorish pattern of hardware, for trimming front, vestibule and inside doors. This design is made in cast bronze, finished in old copper, mottled, and polished brass, natural color. There are also worked out in the same design various other pieces of hardware trimming, including push buttons, drop draw pulls, the various sash lifts, push plates, &c. They issue a monograph of 13 pages, fully illustrating the design in connection with the appropriate locks, giving dimensions and other necessary information.



Alcazar Design.

The Sensible Axe Rack.

The illustration here given is of the Briggs patent sensible axe rack, put on the market by E. Skewes & Co., Neosho, Mo. The rack is arranged to hold 16 handled axes, and 16 axes unhandled, occupying a space 14 x 28 inches. If more capacity is required, it is suggested that two racks can be placed back to back, thus holding 64 axes. The racks are finished with red edges, varnished, and are packed one in a crate; weight, 20 pounds. We are advised that the racks are carried in stock by jobbers in Boston, Chicago, New Orleans, St. Louis, St. Paul and Kansas City.



Sensible Axe Rack.

The Leonard Sectional Drawer Cabinet.

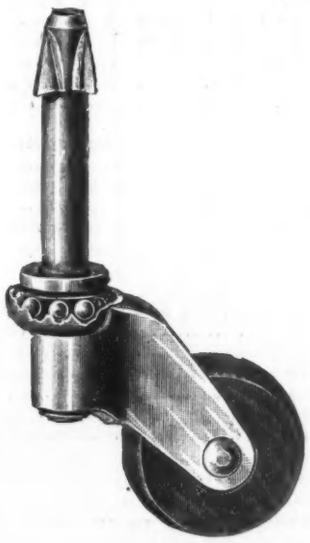
The accompanying illustration represents a sectional drawer cabinet offered by the Leonard Mfg. Company, Grand Rapids, Mich. The cabinet is in sections, the idea of the construction being to allow additions to be made from time to time as the articles to be cared for may increase. The bottom of each section fits into the top of the one below it, except the top section, which is solid.

The Leonard Sectional Drawer Cabinet.

The joint at the end is covered by a strip of metal which also holds the sections in place. By lifting the sections straight up they come apart, as no fastening is required. In each section there are ten drawers, five on each side. Each drawer is hung on a special spline, which plays in a groove near the top, so as to make the drawers work easily. The cabinet is referred to as a fine piece of work, made of oak and polished in gold finish. The construction permits of additional sections being ordered at any time, when they may be placed in anywhere, between the top and bottom. The cabinet may be extended to the ceiling, if desired, or a single section can be set on the desk or a table, if the requirements are such. Each drawer is provided with a solid brass drawer pull with a name plate attached. A card index for classifying and keeping track of every article accompanies each purchase. The cabinet measures 36 inches across the front, and 24 inches deep. The hight of each section is 9½ inches, and the depth of drawers inside is 1⅛ inches. The cabinet is intended for a large variety of small articles to store, arrange or classify, and is referred to as especially adapted for electrotypes, coins, minerals, drawing, engravings, small tools, dental supplies, jewelry, &c.

Standard Ball Bearing Caster.

Standard Caster & Wheel Company, 318-330 East Twenty-third street, New York, have just put on the market the Standard ball bearing Philadelphia or drive

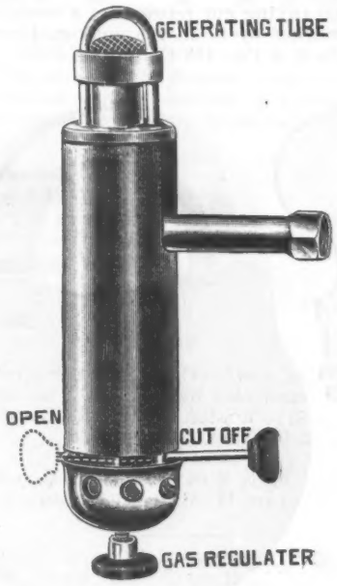


Standard Ball Bearing Caster.

caster, a full size cut of which is here shown of the No. 3 size. The horn is formed from one piece of sheet steel. The stem with upset shoulder and wings is formed from one piece of wire. The steel balls are contained in a cup shaped washer or ball race below the shoulder, which also keeps the stem in a vertical position. There is a stem bearing surface of about ¾ inch. The steel balls have three-point contact. This caster is referred to by the makers as the only anti-friction ball bearing Philadelphia caster in the market. They are made in sizes 2, 3, 4, 5 and 6, in four styles. L. and M. have steel horn with lignum vitæ and maple wheels, the latter being red or dark finish. Styles B. B. and B. L. have polished brass plated horns, and can be had with either brass or lignum vitæ wheels.

The Imperial Gas Lamp Burner.

The burner here shown is used on the Imperial gas lamp, manufactured by the Imperial Gas Lamp Company, 132-134 East Lake street, Chicago, Ill. The lamp burns common stove gasoline, and economically, it is explained, because the gas as it passes continuously through the flame is heated to the proper point, so that when mixed with air there is the correct admixture to give perfect combustion. The point is made that there is neither smoke nor odor with the use of the burner. When the cut off is closed the light, it is stated, goes out instantly, also that it requires no force to either open or close the cut off. It is explained that the light can be turned up or down and as low as desired, and left so for an indefinite time without smoking. The makers claim that the lamp is absolutely safe and that it gives



The Imperial Gas Lamp Burner.

a 100 candle power light. It is made in various styles, which are shown in the company's catalogue.

Schofield's Geared Bi-Treadle Emery Wheel Grinder.

Schofield & Co., Freeport, Ill., have put on the market the geared bi-treadle emery wheel grinder shown herewith. It has a steel frame and requires no belt. The manufacturers state that the grinder will do any grinding that can be done with a grindstone, and will do it twice as fast, also that the machine is more desirable for the use of farmers than a grindstone. Comparing this machine with the makers' bi-treadle grinder, which

Schofield's Bi-Treadle Grinder.

has been on the market for two years, it is remarked that the geared grinder runs with less friction, consequently runs easier, and that it can be sold cheaper than the older machine. A sickle grinder attachment is provided with this machine at an additional cost.

C. H. Smith & Co. is the style of a firm who have recently opened up in business in Franklin Falls, N. H. They are retailers of Shelf Hardware, Farming Tools, Bicycles and Sporting Goods, &c. They report business good so far and are intending to enlarge their storeroom.

New Seamless Padlock No. 4848.

The accompanying cut represents a seamless padlock put on the market by S. R. Slaymaker, Lancaster, Pa., John H. Graham & Co., 113 Chambers street, New York,

New Seamless Padlock No. 4848.

agents. The padlock is a seamless steel rubber enameled case, with cut bronze levers, and is provided with two double bitted steel keys.

The Sterling Kraut Cutter.

The kraut cutter shown in the accompanying cut is put on the market by N. R. Streeter & Co., Rochester, N. Y. The machine is made to clamp securely to any barrel, tub or box. The iron work of the machine is

The Sterling Kraut Cutter.

referred to as being strong, and the knife as being made of the best tempered steel, heavy and stiff. The trough for holding the cabbage is large, and is designed to take in, without cutting, any ordinary sized head. A pusher is provided, to keep the cabbage up to the knife, avoiding danger to the fingers of the operator. The knife is adjustable, so kraut can be made fine or coarse as desired. It is pointed out that with each revolution of the disk which holds the double edged knife two cuts across the face of the cabbage are made. It is shown that the pusher holds the head firmly so that there is no twisting or rolling, and that the leaves do not separate from the body, even though the cabbage be soft. The cutters weigh 21 pounds each, and are packed one in a wooden box.

CONTENTS.

Current Hardware Prices.

REVISED AUGUST 14, 1900.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer, are printed in *Italics*, and the prices named represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. They apply to such quantities of goods as are usually purchased by retail merchants. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Cut Prices.—*In the present condition of the market there is a good deal of cutting of prices by the jobbing trade, whose quotations are often lower than those of the manufacturers.*

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE INDEX SUPPLEMENT (May 3, 1900), which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters Blind—

Domestic, ₩ doz. $3.00...33⅓&33⅓&10%
North's.....10%
Zimmerman's—See *Fasteners, Blind.*

Window Stop—

Ives' Patent.....25&5%

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—American—

Eagle Anvils.....₩ lb 7¼@7¾c
Hay-Budden, Wrought.....9@9¼c
Horseshoe brand, Wrought.....9¼@9¾c
Samson.....₩ lb 7½@8c
Trenton, Wrought.....₩ lb 8½@8¾c
Buel Pat. Trenton.....₩ lb 9@9¼c
Vulcan.....₩ lb 8@8¼c

Imported—

Armitage's Mouse Hole.....8¾@9¼c
Peter Wright's.....9½@9¾c

Anvil, Vise and Drill—

Millers Falls Co., $18.00.....20%

Apple Parers—See *Parers, Apple, &c.*

Aprons, Blacksmiths'—

Hull & Hoyt Co.:
Lots of 1 doz.....25%
Smaller Lots.....20%
Lots of 3 doz.....30%

Augers and Bits—

Common Double Spur.60&10&10@70%
Boring Machine Augers.....60&10&10@70%
Car Bits, 12-in. twist.....60@..%
Jennings' Pattern:
Auger Bits.....60@..%
Ford's Auger and Car Bits..
40&10@40&10&10%
Forstner Pat. Auger Bits.....25%
C. E. Jennings & Co.:
No. 10 ext. lip. R. Jennings' list....40%
No. 30. R. Jennings' List.....50%
Russell Jennings'.....25&10&2½%
L'Hommedieu Car Bits15&10@15&10&5%
Pugh's Black.....20%
Pugh's Jennings' Pattern.....35%
Snell's Auger Bits.....60%
Snell's Bell Hangers' Bits.....50%
Snell's Car Bits, 12-in. twist.....60%
Wright's Jennings Bits (R. Jennings' list).....50%

Bit Stock Drills—

Standard List.....65@65&5%

Expansive Bits—

Clark's small, $18; large, $26.....
50&10%
Lavigne's Clark's Pattern, No. 1, ₩ doz., $26; No. 2, $18.....50&10%
C. E. Jennings & Co., Steer's Pat.....33⅓%
Swan's.....60%

Gimlet Bits—

Common Double Cut..gro. $2.75@3.25
German Pattern.....gro. $5.00@5.50
Double Cut, makers' lists.....
60c&5@50&10%

Hollow Augers—

Ames.....25&10%
Bonney's Adjustable, ₩ doz.....$16.00
New Patent.....25&10%
Universal.....20%

Ship Augers and Bits—

Ford's.....40%
Snell's.....40%
C. E. Jennings & Co.:
L'Hommedieu's.....15&10%
Watrous'.....40%

Awl Hafts, See *Hafts, Awl.*

Awls—

Brad Awls:
Handled.....gro. $2.75@3.10
Unhandled, Shouldered gro.65@66c
Unhandled, Patent.....gro. 66@70c
Peg Awls:
Unhandled, Patent....gro. 31@34c
Unhandled, Shouldered..gro.65@70c
Scratch Awls:
Handled, Common..gro. $3.50@4.00
Handled, Socket..gro. $11.50@12.00

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

First Quality, best brands.$6.25@6.50
First Quality, other brands$6.00@6.25
Jobbers' Special Brands:
Good Quality.....$5.00@5.50
Best Quality.....$6.25
Cheap, Handled Axes.....$5.50@5.75
Beveled, add 25c doz.

Axle Grease—See *Grease, Axle.*

Axles—

	Iron.	Steel.	
Concord, loose collar	6¼c	6 c	2% cash, 10 days.
Concord, solid collar	6¾c	6½c	
No. 1 Common	5 c	4¾c	
No. 1¼ Com. New Style	5½c	5¼c	
No. 2, Solid Collar	5¾c	5½c	
Nos. 7, 8, 11 to 14		.50&10%	
Nos. 7, 8, 11 to 14, 100 sets		.60%	
Nos. 15 to 18		.50%	
Nos. 19 to 22		.60&10%	

Boxes, Axle—

Common and Concord, not turned..
lb. 5c
Common and Concord, turned..lb. 6c
Half Patent.....lb. 9c

Balances—

Sash—

Caldwell new list.....50%
Pullman's.....60%

Spring—

Spring Balances.....50@50&5%
Chatillon's Light Spg. Balances...40&10%
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50%
Chatillon's Large Dial.....30%
Peerless.....50%

Barb Wire—See *Wire, Barb.*

Bars—Crow—

Steel Crowbars, 10 to 40 lb., per lb...
3½@3¾c

Beams, Scale—

Scale Beams, List Jan. 12, '88.....
30@30&5%
Chattillon's No. 1.....30%
Chattillon's No. 2.....40%

Beaters—Egg—

Standard Co.:
No. 5 Steel Handle Dover, ₩ gro. $6.50
No. 10 Cast Handle Dover, ₩ gro. $8.00
No. 10 Steel Handle Dover, ₩ gro $8 00
No. 15 Extra Heavy Steel Handle, ₩ gro. $15.00
Rival, ₩ gro.....$10.00
Taplin Mfg. Co.: ₩ gro.
No. 50 Small Family size.....$6.50
No. 100 Regular Family size.....$8.00
No. 102 Regular Family size, tinned.. $9.50
No. 150 Large Family size.....$15.00
No. 152 Large Family size, tinned.... $17.00
Lyon's, Standard size.....₩ doz. $1.75
Wonder (S. S. & Co.).....₩ gro. $7.50

Bellows—

Blacksmith, Standard List.70@70&5%
C. E. Jennings & Co., Blacksmith..60&10%
C. E. Jennings & Co., Hand.....33⅓%

Blacksmiths—

Inch..	*30*	*32*	*34*	*36*	*38*	*40*
Each..	*$3.70*	*3.95*	*4.55*	*5.10*	*5.70*	*6.55*

Extra Length:
Each..$4.25 4.85 5.40 5.95 6.80 7.95

Molders—

Inch..	*9*	*10*	*11*	*12*	*14*	*16*
Doz...	*$6.75*	*7.85*	*8.50*	*9.50*	*12.00*	*14.50*

Hand—

Inch...	*6*	*7*	*8*	*9*	*10*	*12*
Doz....	*$3.75*	*4.25*	*4.50*	*5.00*	*5.75*	*6.75*

Net Prices.

Bells—Cow—

Ordinary goods.....75&10%
High grade.....70@70&10%
Jersey.....75@75&10%
Texas Star.....60&10%

Door—

Barton Gong.....55%
Gong, Yankee.....55%
Home, R. & E. Mfg. Co.'s.....50&10%
Lever and Pull, Sargent's....30&10&10%

Hand—

Hand Bells, Polished.....65@65&10%
White Metal.....65@65&10%
Nickel Plated.....50@50&10%
Swiss.....60@60&10%

Miscellaneous—

Farm Bells.....lb. 2@2½c
Steel Alloy Church and School.....
50&10&5@60%
Wilmot & Hobbs Mfg. Co, Gongs.....70%

Belting

Rubber—

Common Standard.....70&10@75%
Standard.....60&10@70%
Extra.....60@60&10%
High Grade.....60@60&10%

Leather—

Extra Heavy, Short Lap.....
50&10@50&10&5%
Regular Short Lap.....60@60&10%
Standard.....60&10@60&10&5%
Light Standard.....70%

Cotton—

Rossendale-Reddaway B. & H. Co.:
Sphinx Brand.....60&10%
Durable Brand.....70%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Green River Tire Benders and Upsetters.....20%
Ill. Iron & Bolt Co.....45%
Stoddard's Lightning Tire Upsetters.....40@50%

Bicycle Goods—

John S. Long's Son's 1899 list:
Chain.....50%
Parts.....50%
Spokes.....50%
Tubes.....60%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—Tackle—

Common Wooden.....70@70&5%
Cleve and Steel.....50&10@60&10%
Eddy's Steel.....60&10%
Hartz Steel.....50&10%
Ford's Star Brand Self Lubricating.....
60&10%
Hollow Steel, Ford's Pat. Star Brand.....
50&10%
Lane's Patent Automatic Lock and Junior.....80%
Stowell's Novelty, Mal. Iron.....50%
See also *Machines, Hoisting.*

Boards, Stove—

Zinc, Crystal, &c.....50&10%

Bolts—

Carriage, Machine &c.—

Common, list Jan. 30, '95...70&10@75%
Norway Iron, $3.00, list Oct. 7, '88..
75@75&10%
Phila. Eagle, $3.00 list May 24, '99..80%
Bolt Ends, list Jan. 30, '95.....
70&10@70&10&5%
Machine, list Oct. 1, '99.....
75@75&5%

NOTE.—*Jobbers' prices on Bolts are now often lower than manufacturers', and the market is irregular.*

Door and Shutter—

Cast Iron Barrel, Round Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.33*	*.36*	*.45*	*.57*	*.80*

Cast Iron Spring Foot:

Inch.....	*6*	*8*	*10*
Per doz.....	*$1.00*	*1.35*	*1.75*

Cast Iron Chain, Flat, Japanned:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.85*	*1.20*	*1.50*

Cast Iron Shutter, Brass Knobs:

Inch.....	*6*	*8*	*10*
Per doz.....	*$0.60*	*.90*	*1.15*

Wrought Barrel Brass Knob:

Inch.....	*3*	*4*	*5*	*6*	*8*
Per doz...	*$0.44*	*.50*	*.61*	*.70*	*1.23*

Wrought Barrel.....70&10@75&5%
Wrought " Bronzed.40&5@50&10%
Wrought Flush, B. K..50&10@60&10%
Wrought Shutter...40&10&10@60&5%
Wrought Square Neck.....50@50&10%
Wrought Sunk.....50@50&10%
Ives' Patent Door.....62½@62½&10%

Stove and Plow—

Plow.....50&10@60%
Stove.....67½%

Tire—

Common.....65@65&10%
American Screw Company
Norway Phila., list Oct. 16, '84.....75%
Eagle Phila., list Oct. 16, '24.....77½%
Bay State, list Dec. 28, '99.....65%
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84.....75%
Eagle Phila., list Oct. 16, '84.....77½%
Eclipse, list Dec. 28, '99.....65%
Port Chester Bolt & Nut Company
Empire, list Dec. 28, '99.....65%
Keystone Phila., list Oct. '84.....77½%
Norway Phila., list Oct. '84.....75%

Borers, Tap—

Borers Tap, Ring, with Handle:

Inch.....	*1¼*	*1½*	*1¾*	*2*
Per doz..	*$3.50*	*4.50*	*5.00*	*6 50*
Inch.....		*2¼*		*2½*
Per Doz.....		*$7 50*		*10.25*

Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each.....25@30%

Boring Machines—See *Machines, Boring.*

Boxes, Mitre—

C. E. Jennings & Co.....40%
Seavey's, per doz., $30.....40%

Braces—

NOTE.—*Most Braces are sold at net prices.*
Common Ball, American..$1.10@1 20
Barber's.....50&10&10@60&10%
Fray's Genuine Spofford's.....50&10&5%
Fray's No. 70 to 120, 81 to 123, 207 to 414.....50&10&5%
C. E. Jennings & Co.....50&10%
P., S. & W. Co., Peck's Patent.....
50&10@60%

Brackets—

Cast Iron, plain.....60&10@70&10%
Wrought Steel.....70&5@70&10%
Bradley's Wire Shelf:
Full cases.....80%
Broken cases.....75&10%

Bright Wire Goods—See *Wire and Wire Goods.*

Broilers—

Wire Goods Co.....70@70&10%

Buckets, Well and Fire—See *Pails*

Bucks, Saw—

Hoosier.....₩ gro. $36.00

Bull Rings—See *Rings, Bull.*

Butts—Brass—

Wrought list Sept., '96....25&10@35%
Cast Brass, Tiebout's.....50%

Cast Iron—

Fast Joint, Broad.....50@....%
Fast Joint, Narrow.....50@....%
Loose Joint.....66⅔&5@70%
Loose Pin.....66⅔&5@70%
Mayer's Hinges.....66⅔&5&5@70%
Parliament Butts.....66⅔&5@70%

NOTE.—*Jobbers often undersell manufacturers.*

Wrought Steel—

Loose Joint.....
Table and Back Flaps..
Narrow and Broad.....
Inside Blind.....
Loose Pin.....
Loose Pin, Ball and Steeple Tip
70&5@70&10&5%
Bronzed Wrt. Nar. and Inside Blind Butts.....60&10@50&10&5%

Cages, Bird—

Hendryx, Brass:
2000, 5000, 1100 series.....8%
1200 series.....33⅓%
200, 800, 600 and 900 series.....40&10%
Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks—Toe and Heel—

Blunt.....per lb. 4@4½c
Sharp.....per lb. 4½@4¾c
Perkins' Blunt.....₩ lb 4 c
Perkins' Sharp.....₩ lb 4½c

Can Openers—See *Openers, Can*

Cans, Milk—

	5	8	10 gal.	
Illinois Pattern.	$1 75	2.10	2.25	each.
Iowa Pattern...	....	2.40	2.60	each.
Buffalo Pattern.	....	2.30	2.50	each.
	20	30	40	qts.
New York Patt'rn	3.00	3.25	3 40	each.
Baltimore Patt'rn	2.50	2.85	3.10	each.

Cans, Oil—

Galvanized Blue Band, 1-gal., ₩ doz. $1.60@$1.75

Buffalo Family Oil Cans:

3	5	10 gal.
$48.00	60.00	108 gro.

Glass Oil.....₩ doz. $1.90@$2.20

Caps—Percussion—

Eley's E. B......50c
G. D......*per M 33@34c*
F. L......*per M 37@40c*
G. E......*per M 47@50c*
Musket......*per M 57@60c*

Primers—

Berdan Primers, $1.00.....8%
B. L. Caps (Sturtevant Shells) $1.00.....8%
All other primers.....$1.10@$1.12

Carpet Stretchers—
See *Stretchers, Carpet.*

Cartridges—
B. B. Caps, Con., Ball Swgd.....$1.90
B. B. Caps, Round Ball....$1.12@1.18
Blank Cartridges:
32 C. F., $5 50.....10c&5%
38 C. F., $7 00.....10c&5%
22 cal. Rim, $1.50.....10c&5%
32 cal. Rim, $2.75.....10c&5%
Central Fire.....25%
Pistol and Rifle.....15c&5%
Primed Shells and Bullets.....15c&5%
Rim Fire Sporting.....50%
Rim Fire, Military.....15c&5%

Casters—
Bed.....60c&10c&10@70%
Plate.....60c&10@60c&10c&5%
Philadelphia.....70c&10@70c&10c&10%
Boss.....70&10%
Boss Anti-Friction.....70&10%
Martin's Patent (Phœnix).....45%
Payson's Anti-Friction Furniture.70&10%
Payson's Anti-Friction Truck....70&10%
Standard Ball Bearing.....45%
Tucker's Patent, low list.....30%

Cattle Leaders—
See *Leaders, Cattle.*

Chain—
American Coil, Full Casks:

3/16	*¼*	*5-16*	*⅜*	*7-16*	*½*	*9-16*
7.90	*6.00*	*5.00*	*4.15*	*4.00*	*3.90*	*4.40*
⅝	*¾*	*⅞*	*1 inch.*			
3.70	*3.65*	*3.55*	*3.55 cents per lb.*			

Less than Cask lots add 40c per 100lbs.
German Coil, list July 24, '97.....60&10c&10%
German Halter Chain, list July 24, '97.....60&10c&10%
Traces, Western Standard: 100 pair
6½—6-3, Straight, with ring...$26.00
6½—6-2, Straight, with ring..$27.00
6½—8-2, Straight, with ring..$31.00
6½—10-2, Straight, with ring..$35.00
Add 2¢ per pair for Hooks.
Twist Traces 2¢ per pair higher than Straight Link.
Trace, Wagon and Fancy Chains, list April, '98.....60c&10@60%
Jack Chain, list July 10, '93:
Iron.....60@60c&10%
Brass.....60@60c&10%
Safety Chain.....60c&10c&10@70%
Gal. Pump Chain.....lb 5@5¼c
Breast, Hitching and Rein Chains.
Covert Sad. Works.....50%
Covert Mfg. Co.:
Breast.....35&2%
Halter.....35&2%
Heel.....35&2%
Rein.....35&2%
Stallion.....35&2%
Oneida Community:
Eureka Coil and Halter.....60@60&5%
Niagara Coil and Halters....60@60&5%
Niagara Cow Ties.....45&5@45&10&5%
Am. Coil and Halters....50&10&5@60%
Am. Cow Ties.....35&5@40&5%
Wire Goods Co.:
Dog Chain.....60%
Universal Dbl-Jointed Chain.....45%

Chalk—(From Jobbers.)
Carpenters', Blue.....gro. 45c
Carpenters', Red.....gro. 35c
Carpenters', White.....gro. 50c
See also Crayons.

Chalk Lines—See *Lines.*

Checks, Door—
Bardsley's.....40&10%
Columbia.....50&10%
Eclipse.....60@60&10%

Chests, Tool—
American Tool Chest Co.:
Boys' Chests, with Tools.....35%
Youths' Chests, with Tools.....40%
Gentlemens' Chests, with Tools.....30%
Youths' Chests, Empty.....40%
Gentlemens' Chests, Empty.....30%
C. E. Jennings & Co.'s Machinists' Tool Chests.....25@25&10%

Chisels—
Socket Framing and Firmer
Standard List.....70c&5@75c&5%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60&10%
C. E. Jennings & Co. Socket Framing No. 15.....60&10%
Swan's.....70&5%
L. & I. J. White.....30@30&5%

Tanged—
Tanged Firmers.....40c&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181....25%
L. & I. J. White, Tanged.....25&5%

Cold—
Cold Chisels, good quality.lb. 14@16c
Cold Chisels, fair quality.....lb. 12c
Cold Chisels, ordinary.....lb. 8@9c

Chucks—
Beach Pat., each $8.00.....20%
Skinner Patent Chucks:
Combination Lathe Chucks.....40%
Drill Chucks, Patent and Standard...30%
Drill Chucks, New Model.....2½%
Independent Lathe Chucks.....40%
Improved Planer Chucks.....20%
Universal Lathe Chucks.....40%
Face Plate Jaws.....35%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination.....40%
Czar Drill.....30%
Geared Scroll.....30%
Independent.....40%
Union Drill.....30%
Universal.....40%
Face Plate Jaws.....35%

Clamps—
Adjustable, Hammers'.....20@20&5%
Adjustable, Stearns'.....30%
Cabinet, Sargent's.....45&10%
Carriage Makers', P., S. & W. Co..40&10%
Carriage Makers', Sargent's.....50&10%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see *Vises, Saw Filers'.*

Cleaners Walk—
Star Socket, All Steel....₱ doz. $4.00 net
Star Shank, All Steel....₱ doz. $3.75 net
W. & C. Snaak, All Steel, 7½ in. ₱ doz., $3.35; 8 in., $3.40; 8½ in., $3.50.

Cleavers, Butchers'—
Foster Bros.....30%
New Haven Edge Tool Co.'s.....40&10%
Nichols Bros., Flat hdl., 30%; Rd. hdl., 5%
Fayette R. Plumb.....25%
P., S & W.....33⅓&5@33⅓&10%
L. & I. J. White.....25%

Clippers—
Chicago Flexible Shaft Company:
Handy Toilet.....₱ doz. $7.20
Mascotte Toilet.....₱ doz. $8.40
Monitor Toilet.....₱ doz. $9.00
Stewart's Patent.....₱ doz. $10.00

Clips, Axle—
Eagle and Superior ¼ and 5-16 inch.....70c&10%
Norway, ¼ and 5-16 inch...65c&10@70%

Cloth and Netting, Wire
—See *Wire, &c.*

Cocks, Brass—
Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.).....70c&5@70c&10%

Coffee Mills—See *Mills, Coffee.*

Collars Dog—
Brass, Pope & Stevens' list.....40%
Embossed, Gilt, Pope & Stevens' list30&10%
Leather Pope & Stevens' list.....40%

Compasses, Dividers, &c.
Ordinary Goods.....70c&10@75%
Bemis & Call Hdw. & Tool Co.:
Dividers.....65%
Calipers, Call's Patent Inside.....55%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses.....50%
J. Stevens A. & T. Co.....35&10%

Conductor Pipe, Galvanized—

	Carload.	Loose.	L. C. L. Nested.
Territory.			
Eastern....	*6¾c*	*25c&5%*	*60c&20c&2½%*
Central....	*60c&25c&2½%*		*60c&17½%*
Southern...	*60c&20c&5%*		*60c&15%*
S. Western.	*60c&20%*		*60c&12½%*

Terms, 2% for cash.
See also *Eave Trough.*

Coolers, Water—
Nos.... 2 3 4 6
Labrador $11.50 $14.00 $17.50 $20.00
8 gal.
$26.00
Nos.... 3 4 6 8
Iceland.. $23.00 $25.00 $30.00 $37.50
10 14 gal.
$57.00 $72.00

Coopers' Tools—
See *Tools, Coopers'.*

Cord— Sash—
Braided, Drab.....lb. 25c
Braided, White, Common, lb17½@18c
Cable Laid Italian..lb. A, 18c; B, 16c
Common India.....lb 8½@9½c
Cotton Sash Cord, Twisted....12@16c
Patent Russia.....lb. 12 @13c
Cable Laid Fussia.....lb. 13½@14c
India Hemp, Braided.....lb 14@15c
India Hemp.....lb. 10@12c
Patent India.....lb.10@12c
Pearl Braided, cotton.....₱ lb 16@18¢
Massachusetts, White.....₱ lb 22½¢
Massachusetts, Drab.....₱ lb 26½¢
Eddystone Braided Cotton.....₱ lb 19¢
Harmony Cable Laid Italian.....₱ lb 18¢
Ossawan Mills:
Crown, Solid Braided White...₱ lb 18¢
Braided, Giant, White.....₱ lb 17¢
Peerless:
Cable Laid Italian.....16¢
Cable Laid Russian.....14¢
Cable Laid India.....12¢
Braided India.....18¢
Phœnix, White.....19¢
Samson:
Braided, Drab Cotton.....₱ lb 32½¢
Braided, Italian Hemp....₱ lb 32½¢
Braided, Linen.....₱ lb 40¢
Braided, White Cotton, Spot.₱ lb 28½¢
Silver Lake:
A quality, Drab, 40¢.....15%
A quality, White, 35¢.....15%
B quality, Drab, 35¢.....15%
B quality, White, 30¢.....15%
Italian Hemp, 40¢.....15%
Linen, 57½¢.....15%

Wire, Picture—
Braided or Twisted..80c&10@30c&10 &10%

Corn Knives and Cutters
—See *Knives, Corn.*

Corn Planters—
See *Planters, Corn—*

Crackers, Nut—
Little Giant.....₱ gr. $24.00

Cradles—
Grain.....50%

Crayons—
White Round Crayons, gross...5@6c
Cases, 100 gro., $4.50@$5.00, at factory.
D. M. Steward Mfg. Co.
Metal Workers' Crayons.gr. $2.50
Soapstone Pencils, round, flat or square.....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Case lots 20%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crooks, Shepherds'—
Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—
Victor Garden.....₱ doz. $10.00

Cutters—
Glass—
Smith & Heminway Co.....30%

Meat—
American.....30%

Nos.....	1	2	3	4	5	6
Each.....	$5	$7	$10	$15	$50	$60

Connecticut:

No.....	0	1	8	10	12
Each....	$1.75	2.25	3.00	5.00	8.50

Enterprise.....25@25&7½%

Nos.....	5	10	12	22	32
Each.....	$2	$3	$2.50	$4	$6

Dixon's, ₱ doz.....33⅓&10%

Nos..	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Hale's, ₱ doz.....65%

Nos.....	11	12	13
	$37.00	$33.00	$45.00

Home No. 1, ₱ doz. $26.00.....50&10%
Little Giant, ₱ doz.....33⅓@33⅓&5%

Nos.	305	310	312	340	322
	$35.00	$48.00	$44.00	$74.00	$68.00

Sterling.....33⅓&5%

Nos.....	1	2
Each.....	$2.00	$2.50

Miles' Challenge, ₱ doz.....45@45&10%

Nos.....	1	2	3
	$22.00	$30.00	$40.00

New Triumph No. 605, ₱ doz. $24.00.....33⅓&5%
Woodruff's, ₱ doz.....40%

Nos.....	100	150
	$15.00	$18.00

Chadborn's Smoked Beef Cutter, ₱ doz. $60.00
Enterprise Beef Shavers.....25@30%

Slaw and Kraut—
Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters 24 x 7, 26 x 8, 30 x 9.55%
Kraut Cutters 36 x 12, 40 x 12.....40%
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife, ₱ gr....$18@$20
Slaw Cutters, 2 Knife, ₱ gr....$22@$36

Tobacco—
All Iron, Cheap.....doz. $1.25@$1.50
Enterprise.....25@30%
National, ₱ doz. $21.00.....40%
Sargent's, ₱ doz. $24.00.....50&10&10%

Washer—
Appleton's, ₱ doz. $16.00.....50&10&10%
Bonney's.....₱ doz. $4.75

Diggers, Post Hole, &c.—
Dalbey Post Hole Auger..per doz .$10.00
Iwan's Improved Post Hole Auger....40%
Iwan's Perfection Post Hole Digger....₱ doz. $9.00
Kohler's Universal.....₱ doz, $14.00
Kohler's Little Giant.....₱ doz. $15.00
Kohler's Hercules.....₱ doz. $12.00
Kohler's Invincible.....₱ doz. $10 00
Kohler's Rival.....₱ doz. $9.00
Kohler's Pioneer.....₱ doz. $9.00
Never-Break Post Hole Diggers, ₱ doz. $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers, Money—
Tucker's Pat. Alarm Till No. 1, ₱ doz. $18; No. 2, $15 No. 3, $14; No. 4, $18.

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Common Blacksmiths' Drill...each $1.75@$2.00
Blacksmiths' Self-feeding.....each $3.75@4.00
Bench Drills, Stearns'.....50%
Breast, Millers Falls, each $3.00..15&10%
Breast, P., S. & W.....30@30&10%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....25&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....20@25%
Ratchet, Whitney's, P. S. & W...40&10%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—
Standard List.....60@60c&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Balsey's Screw Holder and Driver, ₱ doz. 2½-inch, $6; 4-in., $7.50 6-in., $9..40%
Buck Bros.....30%
Buck Bros' Screw Driver Bits.....27½%
Champion.....40&10%
Douglass Mfg. Co.....20@20&10%
Fray's Hol. H'dle Sets, No. 3, $12.00 50%
Gay & Parsons' Ratchet.....35%
Goodell's Automatic 50&10&10@50&10&10&5%
Mayhew's Black Handle.....50%
Mayhew's Monarch.....45&10%
New England Specialty Co.....50&10%
Sargent & Co.'s:
Nos. 1,50,55 and 60.....50&10&10%
Nos. 20 and 40.....64⅔&10%
Screw Driver Bits.....₱ doz. 50@70¢
Stanley's R. & L. Co.'s:
No. 64, Varnished Handles.....60&10%
No. 86.....70&10%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized

Territory.	*Carload.*	*L. C. L.*
Eastern.....	*75c&15%*	*75c&10%*
Central.....	*75c&12½%*	*75c&7½%*
Southern.....	*75c&10%*	*75c&5%*
S. Western.....	*75c&2½%*	*75%*

Terms, 2% for cash.
See also *Conductor Pipe.*

Egg Beaters—See *Beaters, Egg.*

Egg Openers—
See *Openers, Egg.*

Emery, Turkish—

	4 to 46	*5& to150*	*Flour.*
Kegs.....lb.	*4½c*	*5 c*	*5 c*
¼ Kegs....lb.	*4¾c*	*5¼c*	*5¼c*
¼ Kegs....lb.	*5 c*	*5½c*	*5¾c*
10-lb cans, 10 in case....	*6 c*	*6½c*	*6¾c*
10-lb. cans, less than 10...	*10 c*	*10 c*	*8 c*

Enameled and Tinned Ware—See *Ware, Hollow.*

Escutcheon Pins—
See *Pins, Escutcheon.*

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Zimmerman's.....50&10%

Faucets—
Cork Lined.....70c&5@70c&10c&5%
Metallic Key, Leather Lined.....70@70c&10%
Red Cedar.....60@60c&5%
B. & L. B. Co.:
West's Lock, Open and Shut Key50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Metal Key.50&10%
John Sommer's Duplex Metal Key....60%
John Sommer's Diamond Lock.....40%
John Sommer's L. X. L. Cork Lined...50%
John Sommer's Reliable Cork Lined. 50&10%
John Sommer's Common Cork Lined.70%
John Sommer's Chicago Cork Lined..80%
John Sommer's O. K. Cork Lined.....50%
John Sommer's Perfection Cedar.....40%
Star.....60@60&5%
Star, Metal Plug new list.....40@40&5%
Lockport, Metal Plug, reduced list.60&5%
Self Measuring:
Enterprise, ₱ doz. $36.00.....40%
Lane's, ₱ doz. $36.00.....40&10%
National Measuring, ₱ doz. $66.00...40%

Felloe Plates—
See *Plates, Felloe.*

Files—Domestic—
List revised Nov. 1, 1899.
Best Brands.....70@75c&5%
Good Brands.....75&10@75c&10c&10%
Fair Brands.....80@80c&10%
Second Quality.....80c&10@80c&25%

Imported—
Stubs' Tapers, Stubs' list, July 24, '97.....25%

Fixtures, Grindstone—
Net Prices:

Inch....	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.90*	*3.10*	*3.30*	*3.80*	*4.60*

Stowell's Giant Grindstone Hanger.....₱ doz. $6.00
Stowell's Grindstone Fixtures.....50%
P., S. & W. Co.....50&10&10%
Reading Hardware Co.....30&20&10%
Sargent's.....60&10@60&10&10%

Fluting Machines—
See *Machines, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Aug. 1, 1899, list.
Hay, 2 tine.....65%
Hay, 3 tine.....66⅔%
Manure, 4 tine.....70%
Manure, 5 and 6 tine.....70%
Spading.....70c&5%
Iowa Dig-Esy Potato.....65%
Victor, Hay.....66⅔%
Victor, Manure.....70%
Victor, Header.....60&30%
Champion, Hay.....66⅔%
Champion, Manure.....70%
Columbia, Hay.....66⅔&5%
Columbia, Manure.....70%
Columbia, Spading.....70%
Hawkeye Wood Barley 4 tine ₱ doz. $5.00; 6 tine, $6.00.
W. & C. Potato Digger.....65%
Acme Hay.....60&20&7½%
Acme Manure.....60&25%
Jackson Steel Barley.....70&10&2½%
Dakota Header.....70&10&2½%
Kansas Header.....65&20%
W. & C. Favorite Wood Parley 4 tine, ₱ doz., $5.00; 5 tine, $6.00
Plated.—See *Spoons.*

Frames—
Saw—
Red, Polished and Varnished..doz. $1.15@$1.30
White.....doz. 75@80c

Screens and Frames—
See *Screens.*

Freezers, Ice Cream—

Qts...	*2*	*3*	*4*	*6*	*8*	*10*
Best.	*$1.40*	*1.60*	*1.85*	*2.50*	*3.00*	*3.90*
Good	*$1 25*	*1.35*	*1.70*	*2.05*	*2.65*	*3.50*
Fair.	*$1.00*	*1.10*	*1.30*	*1.75*	*2.30*	*2.90*

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse—

	Per 1000 Feet.
Hemp Fuse	*$2.60*
Cotton Fuse	*2.90*
Single Taped Fuse	*3.50*
Double Taped Fuse	*4.70*
Triple Taped Fuse	*5.70*

25%

Gates, Molasses and Oil—
Stebbin's.....80@80c&10%

Gauges—
Marking, Mortise, &c.....55c&10@55c&10c&10%
Barrett's Comb. Roller Gauge.....₱ doz. $6.75@7.25
Stanley R. & L. Co.'s Butt & Rabbet Gauge.....30&10%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire P., S. & W. Co.....10@10&5%

Cimlets—
Nail, Metal, Assorted..gro. $1.40@1.75
Spike, Metal, Assorted gro. $3.00@3.50
Nail, Wood Handled, Assorted. gro. $4.00@4.25
Spike, Wood Handled, Assorted gro. $5 00@5.25

Class, American Window
List Jan 1, 1898.
Small lots from store:
Single, Eastern.
First Bracket.....85%
Second and Third Brackets..85&10%
Eastern, All Other Brackets.85&25%
Double, Eastern.
First Bracket.....85%
Second, Third, Fourth and Fifth Brackets.....85&10%
All Other Brackets.....85&20%
From Jobbers or Factory, with Freight Allowance, except in Eastern district:
Carloads, Single Strength.
First Bracket.....85&25%
Second and Third Brackets....89%
All Above.....90&5%
Carloads, Double Strength
First Five Brackets 89%
60 inch Bracket.....90%
70 to 100 inch Bracket, inclusive 90&10&5%
All Above.....90&20%

Clue—Liquid, Fish—
List A, Bottles or Cans, with Brush. 37½@50%
List B, Cans (½ pts., pts., qts.)..... 35½@45%
List C, Cans (½ gal., gal.) ....25@45%

Clue Pots—See *Pots, Glue.*

Crease, Axle—
Common Grade.....gro. $5.00@6.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Dixon's Everlasting, in bxs..₩ doz. 1 lb $1.20; 2 lb $2.00
Snow Flake:
1 qt. cans, per doz. $3.00; 2 qt., $3.20; 1 gal. cans per doz. $6.00; 3 gal. $16.00; 5 gal. $24.00 } 10%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Guards, Snow—
Cleveland Wire Spring Co.:
Galv. Steel ₩ 1000.....$9.00
Copper ₩ 1000.....$18.00

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
gro.
Peg Patent, Leather Top..$4.90@5.25
Peg Patent, Plain Top....$3.50@3.75
Sewing, Brass Ferrule. ...$1.50@1.60
Saddlers', Brass Ferrule..$1.35@1.45
Pey, Common.....$1.25@1.35
Brad, Common.....$1.50@1.75

Halters and Ties—
Covert Mfg. Co., Web.....45&2%
Covert Mfg. Co., Jute Rope.....45&2%
Covert Mfg. Co., Sisal Rope.....30&2%
Covert's Saddlery Works', 96 list, Web..60&10%
Covert's Saddlery Works, Leather60&10%
Covert's Saddlery Works, Jute....60&5%
Covert's Saddlery Works, Sisal.....60%
Covert's Saddlery Works, Manila..60&5%
Covert's Saddlery Works, Cotton.....70%

Hammers—
Handled Hammers—
Heller's Machinists'.....50@50&5%
Heller's Farriers.....50@50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....40&10%
Pecs, Stow & Wilcox.....40@40&5%
Fayette R. Plumb:
Plumb, A. E. Nail.....33⅓&10&2%
Engineers' and B. S. Hand...50&15&2½
Machinists' Hammers.....50&15&2½
Riveting and Tinners'.....33⅓&10&2%
Sargent's C. S. New List.....45&10%

Heavy Hammers and Sledges—
3 lb. and under...lb. 45c
3 to 5 lb.....lb. 36c } 75&5@75
Over 5 lb.....lb. 30c } &10%
Wilkinson's Smiths'.....9½c@10c lb.

Handcuffs and Leg Irons
See *Police Goods.*

Handles—
Agricultural Tool Handles—
Hoe, Rake, Fork, &c.....50&10@60%
Shovel, &c., Wood D Handle.50@50&5%

Cross-Cut Saw Handles—
Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—
Auger, assorted.....gro. $2.40@$2.60
Auger, large.....gro. $3.85@$5.00
Brad Awl.....gro. $1.50@$1.75
Chisel Handles:
Apple Tanged Firmer, gro. ass'd. $2.25@$2 35; large, $2.50@$2.60.
Hickory Tanged Firmer, gro. ass'd. $1.75@$2.25; large, $2 35@$2.50.
Apple Socket Firmer, gro. ass'd, $1.75@$2.00; large, $2 00@$2 25
Hickory Socket Firmer, gro ass'd. $1.60 @ $1.75; large, $1.75 @ $2.00
Hickory Socket Framing, gro. ass'd. $2.50@$2.75; large, $2.65@$2.85
File, assorted.....gro. $1.00@$1.15
Hammer, Hatchet, Axe, &c.....60%
Hand Saw, Varnished, doz. 75@80c
Not Varnished.....55@60c
Plane Handles:
Jack, doz. 25@35c; Jack Bolted.. 55@60c
Fore, doz. 35@38c; Fore, Bolted.. 70@75c

Hangers—
Barn Door, New Pattern, Round Groove, Regular:

Inch	3	4	5	6
Doz	$1.10	1.45	1.80	2.10

Barn Door, New England Pattern, Check Back, Round Groove, Regular:

Inch	3	4	5	6
Doz	$1.50	2.00	2.60	3.25

Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....40%
Railroad.....55%
Coleman Hardware Mfg. Co.:
Car Ball Bearing, ₩ doz. pair $7.50
No. 10 Roller Bearing..doz. pr. 5.50
No. 20 Roller Bearing..doz. pr. 4.50
Nickel.....50%
J. G. C.....50&10%
Cronk Hanger Co.:
Loose Axle.....60%
Roller Bearing.....60&10%
Lane Bros.:
Parlor, Standard.....$3.25
Parlor, New Model.....$3.75
Barn Door, Standard.....60&10%
Covered.....50&10&10&5%
Special.....60&10%
Lawrence Bros.:
Advance.....60%
Cleveland.....60&10%
Crown.....60%
New York.....60%
Peerless.....60&10%
Sterling.....60%
McKinney Mfg. Co.:
No. 2, Standard, $18.....60&10%
No. 1, Special, $13.....60&10%
Stowell Mfg. and Foundry Co.:
Badger.....60%
Baggage Car Door.....33⅓%
Climax Anti-Friction.....50%
Elevator.....40%
Interstate.....50&10%
Magic.....50%
Matchless.....50&10%
Nansen.....50&10%
Parlor Door.....50%
Railroad.....50&10%
Street Car Door.....50&10%
Steel, Nos. 300, 400, 500.....40&15%
Wild West.....50&5%
Zenith for Wood Track.....50&10%
Taylor & Boggis Foundry Co.:
Kidder's.....50@50&10%
Van Wagoner & Williams Hdw Co.:
American Trackless.....33⅓&10%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing.....60&10&5%
New Era Roller Bearing.....50&10%
O. K. Roller Bearing.....60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing.....60&10%
Tandem Nos. 1 and 2.....60%
Underwriters' Roller Bearing....40%
Wilcox Auditorium Ball Bearing.20%
Wilcox Barn Trolley No. 123.....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century.....50&10&10%
Wilcox Trolley Ball Bearing.....40%

Extra 5@10% often given.

Harness Menders—See *Menders.*

Harness Snaps—See *Snaps.*

Hasps—
McKinney's Perfect Hasp ₩ doz40&10%
Wrought Hasps, Staples, &c.—See *Wrought Goods.*

Hatchets—
Best Brands.....40&10@50%
Cheaper Brands....50&10@50&10&5%
Note.—Net prices often made.

Hay and Straw Knives—
See *Knives.*

Hinges—
Blind and Shutter Hinges—
Acme and Dixie Shutter:

No.	1	1½	2	2½
Doz. pair	$0.65	.60	.55	.47

Buffalo and Queen City Reversible Shutter:

No	1	1½	2
Doz pair	$0.65	.60	.55

Lull & Porter Old Style Shutter:

No.	1	1½	2	2½
Doz. pair.	$0 65	.60	.55	.47

1868 Old Pattern Blind Hinge:

No.	1	3	5
Doz. pair	$0.75	1.35	2.60

Parker.....70@75%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Reading's Gravity.....75&10%
Sargent's, Nos. 1, 3, 5.....66⅔&10%
Sargent's, Nos. 11 & 13.....70&10%
Wrightsville Hdware Co.:
Acme, Lull & Porter.....65&10&5%
Buffalo Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Champion Gravity Locking, No. 75.75%
1868, Old Pat'n, Nos. 1, 3 & 5.....75%
Tip Pattern, Nos. 1, 3 and 5.....75%
Double Locking, Nos. 20 and 25.....70%
Empire, Nos. 101 and 103.....65&10%
Niagara Gravity Locking, Nos. 1, 3 and 5.....65&10&10%
Noiseless, Nos. 56, 60, 65 and 55.....65&10&5%
O. S. Lull & Porter.....65&10&10%
Pioneer, Nos. 060, 45 and 5½.....65&10&5%
Steamboat Gravity Locking, No. 10..75%
Stanley's Steel Gravity Blind Hinges, ₩ doz. sets $1.20.....20&10%

Gate Hinges—
Clark's or Shepard's—Doz. sets:

No.	1	2	3
Hinges with Latches.	$1.90	2.50	4.25
Hinges only	1.30	1.55	3.20
Latches only	0.70	0.70	1.20

New England:
With Latch.....doz $1.75@1.80
Without Latch.....doz. $1.40@1.45
Reversible Self-Closing:
With Latch.....doz. $1.65@1.75
Without Latch.....doz. $1.30@1.35
Western:
With Latch.....doz. $1.60@1.65
Without Latch.....doz. $1.00@1.05

Spring Hinges—
Holdback, Cast Iron..gro. $9.00@10.00
Non-Holdback, Cast Iron..... gro. $7.00@$7.50
J. Bardsley
Bardsley's Patent Checking.....15%
Bommer Bros.:
Bommer's.....33⅓%
Chicago Spring Butt Co.:
Chicago.....20%
Floor Hinge.....40%
Garden City Engine House.....20%
Keene's Saloon Door.....20%
Triple End.....40%
Coleman Hdw. Co.:
Champion Holdback...₩ gr. $10.00
J. G. C.....₩ gr. $9.50
Nickel.....₩ gr. $9.00
Lawson Mfg. Co.:
Matchless.....25%
Matchless Pivot.....40%
Payson Mfg. Co.:
Oblique, Dbl. Acting.....50@50&5%
Stover Mfg. Co.:
Ideal, No. 16, Detachable, ₩ gr. $12.50
Ideal, No. 4.....₩ gr. $9.00
New Idea No. 1.....₩ gr. $9.00
New Idea, Double Acting.....45%
Van Wagoner & Williams Hdw. Co.:
Acme, Wrt. Steel.....30%
Acme, Brass.....20%
American.....30%
Columbia, No. 14.....₩ gr. $9.00
Columbia, No. 18.....₩ gr. $25.00
Columbia, Adjustable.....30%
Gem, new list.....25%
Clover Leaf.....₩ gr. $12.50
Oxford new list.....25%

Extra 10% often given on most of these Hinges.

Wrought Iron Hinges—
Strap and T Hinges, &c., list Mar. 15, 1898:
Light Strap Hinges..66⅔%
Heavy Strap Hinges..70%
Light T Hinges....50&10%
Heavy T Hinges...60&10%
Extra Heavy T Hinges... 66⅔% } Extra 25@25 &5%
Hinge Hasps.....45
Cor. Heavy Strap.....70%
Cor. Ex. Heavy T.....66⅔%
Rolled Plate.....70@70&5%
Screw Hook and Strap. { *6 to 12 in..lb 3 @3¼c* ; *14 to 20 in..lb. 2¾@3 c* ; *22 to 36 in..lb. 2½@2¾c*
Screw Hook and Eye:
¾@1 inch.....lb. 5½@5¾c
⅝-inch.....lb. 6½@6¾c
½-inch.....lb. 8½@8¾c

Hoes—
Eye—
Scovil and Oval Pattern..... 60&5@60&10&5%
Grub, list Feb. 23, 1899....65@65&10%
D. & H. Scovil.....35%

Handled—
Aug. 1, 1899, List:
Field and Garden.....75&2%
Ladies', Boys', Toy and Onion... 70&10&10%
Street and Mortar .....75&7½&2%
Cotton.....70&10&10&5&2%
Planters'.....70&50%
Weeding.....75%
Note.—Manufacturers and jobbers use a diversity of lists, and often sell at net prices.
Ft. Madison Crucible Garden Hoe..... 75&2%
Ft. Madison Crescent Cultivator Hoe, per doz.....75&10&2%
Ft. Madison Mattock Hoes:
Regular Weight.....₩ doz. $4.50
Junior Size.....₩ doz. $4.00
Ft. Madison Sprouting Hoe, ₩ doz. $4.80
Ft. Madison Dixie Tobacco Hoe..75&20%
Kretsinger's Cut Easy, per doz....75&2%
Warren Hoe.....60%
W. & C. Ivanhoe.....75&2%
B. B. Cultivator Hoe.....75&10%
Acme Weeding.....75&10%
W. & C. Lightning Shuffle Hoe, ₩ doz. $5.50

Hog Rings and Ringers—
See *Rings and Ringers.*

Hoisting Apparatus—
See *Machines, Hoisting.*

Hollow Ware—
See *Ware, Hollow.*

Holders—
Bit—
Angular, ₩ doz. $24.00..... 45&10%
File and Tool—
C. E Jennings & Co. Model Tool Holders.....33⅓%
Nicholson File Holders and File Handles.....33⅓%

Hooks—
Cast Iron—
Bird Cage, Reading..... } .50&10@60%
Bird Cage, Sargent's List.. }
Clothes Line, Sargent's List.....50&10%
Ceiling, Sargent's List....20&10&10&10%
Clothes Line, Stowell's.....70%
Clothes Line, Reading List 65&10@65&10&10%
Coat and Hat, Stowell's 70%
Coat and Hat, Reading.....70@75%
Coat and Hat, Sargent's List.....35&10%
Coat and Hat, Wrightsville .....65&10%
Harness, Reading List.....70&10@75%
Wire—
Belt.....75@75&10%
Atlas, Coat and Hat:
Single Cases.....45%
10 Case Lots.....45&10%
Czar Harness.....50&10&5%
Wire Coat and Hat:
Acme.....50&10&5%
B. B.....50&10&5%
V Brace, Chief and Czar.....50&10&5%
Gem.....50&10&5%
Bright Wire Goods—See *Wire.*
Wrought Iron—
Box, or Case, Octagon Steel.... doz. $2.10@2.20
Cotton.....doz. $1.05@1.15
Wrought Staples, Hooks, &c.—See *Wrought Goods.*

Miscellaneous—
Bush, Light, doz. $5.50; Medium, $6.00; Heavy, $6.50
Grass.....Nos. 1 2 3 4
Best..... $1.50 1.75 2.00
Common. .. $1.40 1.40 1.50 1.75
Potato and Manure 70%
Whiffletree.....lb. 4½c
Hooks and Eyes:
Brass.....60&10&10@70%
Malleable Iron .....70&5@70&10%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60&10%
Crown Picture.....50&10%
Bench Hooks—See *Bench Stops.*
Corn Hooks—See *Knives, Corn.*

Horse Nails—See *Nails, Horse*

Horseshoes—
See *Shoes, Horse.*

Hose Rubber—
Garden Hose, ¾-inch:
Competition.....ft. 4¼@ 4¾c
3-ply Standard .....ft. 5 @ 6 c
4-ply Standard.....ft. 8 @ 9 c
3-ply extra.....ft. 9 @10 c
4-ply extra .....ft. 11 @12 c
Cotton Garden, ¾-in., coupled:
Low Grade .....ft. 6 @7 c
Fair quality.....ft. 8 @9 c

Irons—Sad—
From 4 to 10..... lb 3@3¼c
B. B. Sad Irons.....lb. 3½@4c
Chinese Laundry.....lb. 5@5½c
Chinese Sad.....lb. 3½@3¾c
Mrs. Potts', per set:

Nos.	50	55	60	65
	72c	69c	82c	79c

New England Pressing..lb.. 3½@3¾c

Soldering—
Soldering Coppers.....lb. 21@23c
Covert Mfg. Co.....30&2%

Pinking—
Pinking Irons.....doz. 50@60c

Jack Screws—See *Screws.*

Jacks, Wagon—
Covert Mfg. Co., Steel.....45&2%
Dalsy.....70%
Ill. I. & B. Co Wagon.....65%
Lockport.....40@40&10%
Victor.....60%
Lane's Steel.....40%

Kettles—
Brass, Spun, Plain..... ..20@25%
Enameled and Cast Iron—See *Ware, Hollow.*

Knife Sharpeners—
See *Sharpeners, Knife.*

Knives—
Butcher, Shoe, &c.—
Dick's Butcher Knives.....40%
Foster Bros.' Butcher, &c.....30%
Nichols' Butcher Knives.....50%
Hay and Straw—See *Hay Knives.*
Corn—
Ft. Madison Cut-Easy, ₩ doz.....$3.25
Withington Acme, ₩ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.
Drawing—
Standard List.....70&5@..%
Adjustable Handle.....25@33⅓%
Bradley's.....35%
C. E. Jennings & Co. Nos. 45, 46..40&10%
Jennings & Griffin.....60&5%
Swan's.....70&10&14%
Watrous.....30&10@40%
L. & I. J. White.....20&5@25%
Cautelo's Folding.....50@50&5%
Hay and Straw—
Blizzard.....$5.75@6.00
Iwan's Sickle Edge.....₩ doz. $11.50
Lightning.....$7.50
Mincing—
Buffalo.....₩ gro. $15.00
Smith's, ₩ doz., Single, $2; Double, $3 45@50%
Miscellaneous—
Farriers'.....doz. $2 00@3.00
Wostenholm's.....₩ doz. $3.00@3.25

Knobs—
Base, 2¼-inch, Birch, Rubber tip, gro ....$1.35@1.40
Carriage, Jap, all sizes..gro. 30@33c
Door, Mineral.....doz. 68@70c
Door, Por. Jap'd.....doz. 75@80c
Door, Por. Nickel....doz. $2.10@2.20
Bardsley's Wood Door, Shutter, &c...15%
Picture, Sargent's.....60&10%
Snow's Victor.....50&10%

Ladders, Step—
Handy Ladder Works:

Extended Length. Feet.	Shipped Ready for Use Feet.	Shipped K. D., Per doz.	Per doz.
4	7	$16.00	$14.00
5	9	19.50	17.00
6	11	24 50	21.00
7	13	29.50	25.00
8	15	34.00	29.00
9	17	39.00	32.00
10	19	43.00	35 00
11	21	46 50	40.00
12	23	51.00	45.00

Ladles—Melting—
L. & G. Mfg. Co.....60%
P., S. & W.....40@40&10%
Reading.....50&10%
Sargent's.....40@40&10%

Lanterns—Tubular—
Regular Tubular..... doz. $4.00@4.50
Side Lift Tubular....doz. $4.25@4.75
Square Lift Tubular..doz. $4.21@4.75
Other Styles.....40@10@40@10&5%

Bull's Eye Police—

2¾-inch flash light....doz. $3.50@3.75
3-inch flash light.....doz. $4.00@4.25
2¾-inch regular .....doz. $3.25@3.50
3-inch regular.....doz. $3.50@3.75

Latches, Thumb—

Roggin's Latches.....doz. 32@33c

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Small.....doz. 45c; large, 55c
Covert Mfg. Co.....45&2%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Dickson:
3 x 4 ft. x ¼.....₱ 100 $11.00
Other sizes, Iron .....70&10%
Other size, Brass and Bronze.....70%
Excelsior .....80@60&10%
Payson's:
Solid Grip Nos. 643 and 644, ₱ 1.00
Bronzed Iron..... ..... 70%

Lines—

Wire Clothes, Nos...	*18*	*19*	*20*
100 feet.....	*$2.90*	*2.50*	*1.95*
75 feet.....	*$2.15*	*1.90*	*1.65*

Ossawan Mills.
Crown Solid Braided Chalk..... ..33⅓%
Mason's, No. 0 to No. 5.....33⅓%
Samson Cordage Works:
Solid Braided Chalk, No. 0 to 3.....40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gr.....30%

Locks, &c.— Cabinet—

Cabinet Locks.....33⅓@33⅓&7⅓%

Door Locks, Latches, &c.—

[Net prices are very often made on these goods.]

Reading Hardware Co.....40%
R. & E. Mfg. Co.....60%
Sargent & Co.....40@40&10%
Slaymaker-Barry Co.....30@35%
Snow's Victor.....50&10%

Elevator—

Stowell's.....33⅓%

Padlocks—

Wrought Iron, list Dec. 3, '97.....70@70&10%
Dog Collar, S. B. Co.....40%
R. & K. Mfg. Co. Wrt. Steel and Brass.50%
S. B. & Co.....40%

Sash, &c.—

Fitch's Bronze and Brass.....66⅔%
Fitch's Iron.....70%
Ives' Patent.....62½&10@66⅔&10%
Oefinger's Automatic.....50%
Payson's Perfect.....70%
Payson's Signal (new list).....75%
Reading.....60&10&10@70%

Machines—

Boring—

Without Augers.

Upright.	Angular.
Improved No. 3...$4.25	No. 1 $5.00
Improved No. 4... 3.75	No. 2 3.38
Improved No. 5... 2.75	
Jennings'..... 2.50	3.00
Millers' Falls.....	5.75
Snell's, Rice's Pat. 2.50	2.75
Swan's, No. 500.. 5.10	No. 200 6.45

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.20%

Ice Cutting—

Chandler's.....15%

Washing—

Wayne American, ₱ doz. $28.00
Western Star, No. 2, ₱ doz..... 28.00
Western Star, No. 3, ₱ doz..... 30.00
St. Louis, No. 41, ₱ doz.. 60.00
Carload lots 10% off. Freight allowed.

Mallets—

Hickory .....45&5@50&5%
Lignumvitæ.....45&5@50&5%
Tinners', Hickory and Applewood, doz.....50@55c
Fiber Head Stearns'.....30&10%

Mats—

Door—

Elastic Steel (W. G. Co.)..... ....10%

Mattocks—

See *Picks and Mattocks.*

Meat Cutters—

See *Cutters, Meat.*

Milk Cans—See *Cans, Milk*

Mills— Coffee—

Box and Side, list Jan. 1, '83..... 50&10&5@60&5%

Net prices are often made on some goods which are lower than above discounts.

Enterprise Mfg. Co.....25@30%
National, list Jan. 1, '04.....30%
Parker's Columbia and Victor@..... 50&10@60%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros.....30%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Net prices are generally quoted.

Cheap.....all sizes, $2.00
Good.....all sizes, $2.50@3.75

10	*12*	*14*	*16-inch*
High Grade 4.25	*4.50*	*4.75*	*5.00*

Pennsylvania and Continental 60&10&5%
Quaker City.....70&5%
Great American.....70&5%
Philadelphia:
Styles M., S., C., K., T.....70&10%
Style A, all Steel.....60&10%
Style E, Low Wheel.....60&10%
Style E, High Wheel.....70&10%
Drexel and Gold Coin, low list.....50%

Nails—

Cut and Wire. See Trade Report.
Wire Nails and Brads, Papered. List July 20, 1899.....85@85&10%
Hungarian, Finishing, Upholsterers', &c. See Tacks

Horse—

Nos.	6	7	8	9	10
A. C.....	25¢	23¢	22¢	21¢	21¢

40&5%

Capewell.....	19¢	18¢	17¢	16¢	16¢10&5%
C. B. K.....	25¢	25¢	22¢	21¢	21¢...40%
Champlain...	28¢	26¢	25¢	24¢	23¢ 40&5&2%
Maud S.	25¢	23¢	22¢	21¢	21¢...50%
Neponset.....	23¢	21¢	20¢	19¢	18¢...40%
Putnam	23¢	21¢	20¢	19¢	18¢.33⅓%
Standard.....	23¢	21¢	20¢	19¢	18¢...40%
Star.....	23¢	21¢	20¢	19¢	18¢. 35& 5%
Vulcan	23¢	21¢	20¢	19¢	18¢..... 25&10%

Picture

	1½	2	2½	3	3½ in.
Brass Head.	*.55*	*.60*	*.70*	*.95*	*1.00 gro.*
Por. Head...	*..*	*1.10*	*1.10*	*1.10*	*.. gro.*

Nippers, See *Pliers and Nippers.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—

List Feb. 1, '99.
Cold Punched Mfrs. or U. S. Standard. Off list.
Hexagon, plain.....4.40@4.50c
Square, plain.....4.30@4.40c
Square, C. T. & R.....4.10@4.20c
Hexagon, C. T. & R.....4.70@4.80c
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd. Square.....5.20@5.30c
Hexagon.....5.50@5.60c

NOTE.—*Tapped Nuts are now 2-10c. higher than above.*

Oakum—

Best or Government.....lb. 6¼c
Navy.....lb. 5 c
U. S. Navy.....lb. 5¾c
Plumbers' Spun Navy.....3 c
In carload lots ¼c lb. off f. o. b. New York.

Oil, Axle—

Snow Flake: 33⅓&10%
1 pt. cans, per doz..... $3.00
1 qt. cans, per doz..... $4.80
1 gal. cans, per doz..... $15 00
5 gal. cans, per doz..... $66.00

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....40&10@50%
Tin or Steel .....60&10@65%
Zinc .....60&10@65%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4; No. 3, $4.40 ₱ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
Wilmot & Hobbs Mfg. Co ....70@70&10%

Openers—

Can—

French.....doz. 35c
Iron Handle.....doz. 25@27c
Sprague, Iron Hdle..per doz 35@40c
Sardine Scissors...doz. $1.75@$3.00
Tip Top.....per doz. $0.75
National, ₱ gro.....$1.75@$2.00
Stowell's .....per doz. 40@45c

Egg—

Nickel Plate.....per doz., $2.00
Silver Plate.....per doz., $4.00

Packing—

Rubber—

Standard, fair quality....70&10@75%
Inferior quality .....75&10@80%
Extra.....60&5@60&10&5%
Jenkins' Standard, ₱ ℔ 80¢...25@25&5%

Miscellaneous—

American Packing.....9@10c lb.
Cotton Packing.....13@14c lb.
Italian Packing.....10½@11¼c lb.
Jute.....5@5¼c lb.
Russia Packing.....12@13c lb.

Pails—

Creamery—

S. S. & Co., with gauges.. No 1 $6.50; No. 2, $6.75 ₱ doz.

Galvanized—

Price per gro.

Inch.....	*10*	*12*	*14*
Water, Regular ..	*18 00*	*21 00*	*24.00*
Water, Heavy....	*22.00*	*25.00*	*28.00*
Fire, Rd. Bottom.	*31.00*	*33.00*	*35.00*
Well.....	*27.00*	*29.00*	*31.00*

Pans—

Dripping—

Standard List.....60@60&5%

Fry—

Standard List.....75&10@80%

Roasting and Baking—

Regal, S. S. & Co., ₱ doz., Nos. 5, $4.50; 10 $5.00; 20 $5.50; 30, $6.00
Simplex, ₱ gro., No. 40, $30.00; 50, $34.50; 60 $39 00; 140, $33.00; 150, $37 50; 180, $43.00.

Paper—

Building Paper—

	Per roll
Rosin Sized Sheathing:	*500 sq. ft.*
Light wt. 20 sq. ft. to lb	*$0 40@0.45*
Medium wt., 12 sq. ft. to lb	*$0.60@0.65*
Heavy wt, extra quality	*$0.95@1.05*
Medium Grades Water Proof Sheathing	*$0.80@1.25*
Deafening Felt, 9, 6 and 4½ sq. ft. to lb., ton	*$43.00@45.00*
York Haven Waterproof Sheathing	$1 35@1.75

Tarred Paper.

1 ply (roll 200 sq ft.), ton..$32 00@37.00
2 ply, roll 100 sq. ft.....75c
3 ply, roll 100 sq. ft.....$1.00

Sand and Emery—

List Dec. 23, 1899...50&10@50&10&5%
See Trade Report.

Parers—

Apple—

Advance.....	₱ doz. $4.50
Baldwin.....	₱ doz. $5.00
Bonanza.....	each $5.00
Dandy.....	each $7.50
Eureka, 1898.....	each $16.00
Family Bay State.....	₱ doz. $12.00
Hudson's Little Star.....	₱ doz. $4.00
Hudson's Rocking Table....	₱ doz $5.50
Improved Bay State	₱ doz. $27.00@30.00
New Lightning.....	₱ doz. $5.50
Reading 72.....	₱ doz. $4.00
Reading 78.....	₱ doz. $7.00
Turn Table '98.....	₱ doz. $5.50
White Mountain.....	₱ doz. $4.00

Potato—

Saratoga.....	₱ doz. $5.50
White Mountain.....	₱ doz. $4.50

Picks and Mattocks—

List Feb. 23, 1899.....65@65&10%

Pinking Irons—

See *Irons, Pinking.*

Pins—

Escutcheon—

Brass .....60&10%
Iron, list Nov. 11, '85.....60&10%

Pipe, Cast Iron Soil—

Factory Shipments.

Standard, 2-6 in.....65&10%
Extra Heavy, 2-6 in.....70%
Fittings 75%

Pipe, Merchant, Boiler Tubes, &c.—

Carloads to Consumers.
Merchant Pipe.

	Black.	*Galvanized.*
⅛ to ½ inch.....	*63%*	*50½%*
¾ to 10 inch.....	*70½%*	*58%*

Boiler Tubes.

Steel.	*Up to 22 feet.*	*22 feet and over.*
1 to 1½ inch	*50%*	*45%*
1¾ to 2¼ inch.....	*42%*	*30%*
2½ inch.....	*50%*	*45%*
2¾ to 13 inch.....	*55%*	*50%*
Iron.		
1 to 1½ inch.	*45%*	*40%*
1¾ to 2¼ inch	*40%*	*34%*
2½ inch	*45%*	*40%*
2¾ to 13 inch	*52½%*	*47½%*
Casing.		*S. & S.*
2 to 2¾ inch		*42%*
3 to 4½ inch and 7⅝ to 12½ inch ..		*50%*
4¾ to 7¼ inch.....		*60%*

NOTE.—*The old list is still used by some jobbers, and net prices are often quoted.*

Planes and Plane Irons—

Wood Planes—

Molding.....40&2½@40&5%
Bench, First quality..... 45&10@45&10&5%
Bench, Second quality..... 50&10@50&10&5%
Bailey's (Stanley R. & L. Co) 50&10@50&10&10%
Gage Self Setting 35%

Iron Planes—

Bailey's (Stanley R. & L. Co)..... 50&10@50&10&10%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10@25&10&10%
Sargent's.....50&10&10%

Plane Irons—

Wood Bench Plane Irons.. 35@35&5%
Buck Bros.....30%
Butcher's.....$5.00@5.25 to 2
Stanley R. & L. Co... 50&10@50&10&10%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand.

Kohler's Eclipse.....₱ doz. $9.00

Plates—

Felloe.....lb 3½@3¾c
Self-Sealing Pie Plates (S. S. & Co.), ₱ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....65&10@70&10%
Gas Burner, per doz., 5 in., $1.15@ $1.20: 6 in., $1.35@$1.45.

Gas Pipe..	*7*	*8*	*10*	*12-in.*
	$1.75	*$2.00*	*$2.75*	*$3.75*

Acme Nippers..... 40@40&5%
Bernard's:
Parallel Pliers, &c.....33⅓%
Paragon Pliers..... .....50%
Lodi Pliers.....50%
Elm City Fence Pliers.....33⅓%
Crouse Hanger Co.:
Cronk's.....60%
Improved Button.....70&5%
Stub's..... 50%
Combination and others..... 40%
Heller's Farriers' Nippers, Pincers, and Tools 50@50&5%
Morrill's Parallel, ₱ doz. $12.00...30&5%
P., S. & W. Cast Steel .....30&10@40%
P., S. & W. Tinners' Cutting Nippers, 40@40&5%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Plumbs and Levels..... 70&10@70&10&10%
Davis Iron, Machinist No. 1 to 14....20%
Davis Iron, Adjustable Nos. 6 to 40....35%
Disston's.....70%
Pocket Levels.....75&10&10@75&10%
Stanley R. & L. Co.. ..... 70&10@70&10&10%
Stanley's Duplex..... 25&10@25&10&10%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ doz., No. 1, $7.20; No. 2, $11.00 No. 3, $11.00; No. 4, $14.50.....1.....50%

Points, Glaziers'—

Bulk and 1 lb. papers.. lb. 11½@12 c
½-lb. papers..... lb. 12 @12½c
¼-lb. papers..... lb. 12½@13 c

Pokes, Animal—

Ft. Madison Hawkeye.....₱ doz. $3.25
Ft. Madison, Western.....₱ doz. $3.75

Police Goods—

Manufacturers' Lists.....25@25&5%
Tower's..... .....25%

Polish—Metal—

Prestoline Liquid, No. 1 (¼ pt.), ₱ doz. $3.00; No. 2 (1 qt.), $9.72.....40%
Prestoline Paste.....33⅓&40%
U. S. Metal Polish Paste, 3 oz. boxes, ₱ doz. 50¢; ₱ gr. $4.50; ½ ℔ boxes, ₱ doz. $1.25; 1 ℔ boxes, ₱ doz. $2.25.
U. S. Liquid, 8 oz. cans, ₱ doz. $1.25; ₱ gr. $12.00.
Barkeepers' Friend Metal Polish, ₱ doz. $1.75; ₱ gr. $18.00.
Wynn's White Silk, ½ pt. cans, ₱ doz. $1.50

Stove—

Black Eagle Benzine Paste, 5 ℔ cans .. ₱ ℔ 10¢
Black Eagle, Liquid, ½ pt. cans..... ₱ doz. 75¢
Black Jack Paste, ¼ ℔ cans, ₱ gro. $9.00
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ₱ gr. $5.75.....10%
Dixon's Plumbago.....₱ ℔ 8¢
Fireside.....₱ gr. $2.50
Gem, ₱ gr. $4.50.....10%
Japanese.....₱ gr. $3.50
Jet Black.....₱ gr. $3.50
Peerless Iron Enamel, ½ pt. cans..... ₱ doz. $1.50
Wynn's Black Silk, 5 ℔ pail.....each 70¢
Wynn's Black Silk, ½ ℔ box, ₱ doz. $1.00
Wynn's Black Silk, 5 oz. box, ₱ doz. $0.75
Wynn's Black Silk, ½ pt. liq., ₱ doz. $1.00

Poppers, Corn—

Round or Square:
1 qt..... gro. $7 00@$8.00
1½ qt..... gro. 9 50@ 10 50
2 qt..... gro. 10.50@ 11.50

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Enameled.....40&10@50%
Tinned .....40&5@50%

Powder—

In Canisters:
Duck, 1 lb. each.....45c
Fine Sporting, 1 lb. each.....75c
Rifle, ½-lb. each.....15c
Rifle, 1-lb. each..... .....25c
In Kegs:
Duck, 6½-lb. kegs.....$2.25
Duck, 12½-lb. kegs.....$4.25
Duck, 25-lb kegs.....$8.00
Rifle, 6¼-lb kegs.....$1.25
Rifle, 12½-lbkegs..... ..... $2.25
Rifle, 25-lb. kegs..... .....$4.00
King's Smokeless Shot Gun and Rifle: 20&2½&2½%
Keg (25 ℔ bulk).....$22 00
Half Keg (12½ ℔ bulk).....$11.25
Quarter Keg (6¼ ℔ bulk).... $5.75
Canister (1 ℔ bulk) $1.00
King's Semi-Smokeless: 20&2½&2½%
Keg (25 ℔ bulk).....$16.00
Half Keg (12½ ℔ bulk).....$8.25
Quarter Keg (6¼ ℔ bulk).....$2.75
One Pound Can, bulk.....$0.50

Presses—

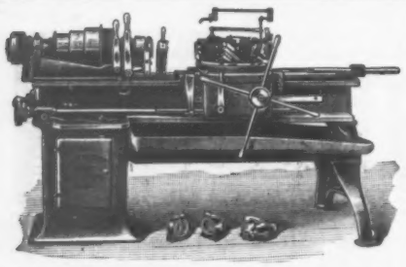
Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Crown, ₱ doz. $13.00.....50%
Crown France, ₱ doz. $15.00.....50%
Cyclops.....40@40&10%
Diamond B, No. 2, doz. $22.; No. 3, $11.....40%
Eureka, 5 ℔, doz., $16.00; 3 ℔ $15...40%
Giant, No. 1, ₱ doz. $18; No. 2, $16.50; No. 3, $15.....40%
Miller's Falls, No. 3, per doz. $12.00..... 15&10%
Pelican, ₱ doz. $9.00.....40&10%
Scranton No. 1 and 2, ₱ doz..... $9.00
Scranton, No. 3, ₱ doz..... $8.40



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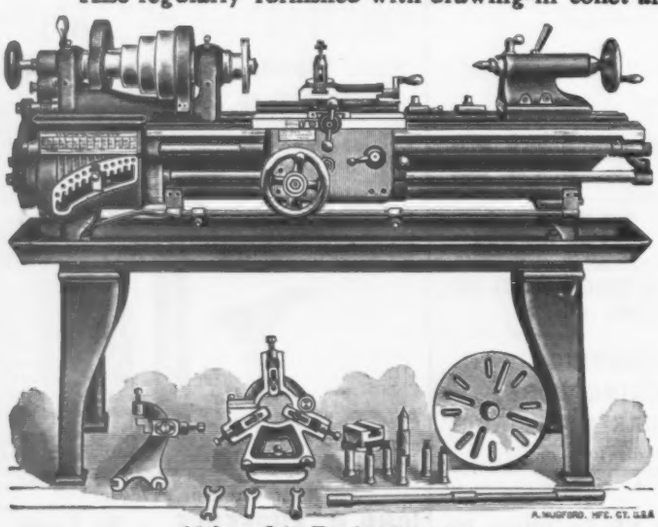

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